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POLLUTION CAUSED FISH KILLS - 1968

Federal Water Pollution Control Administration
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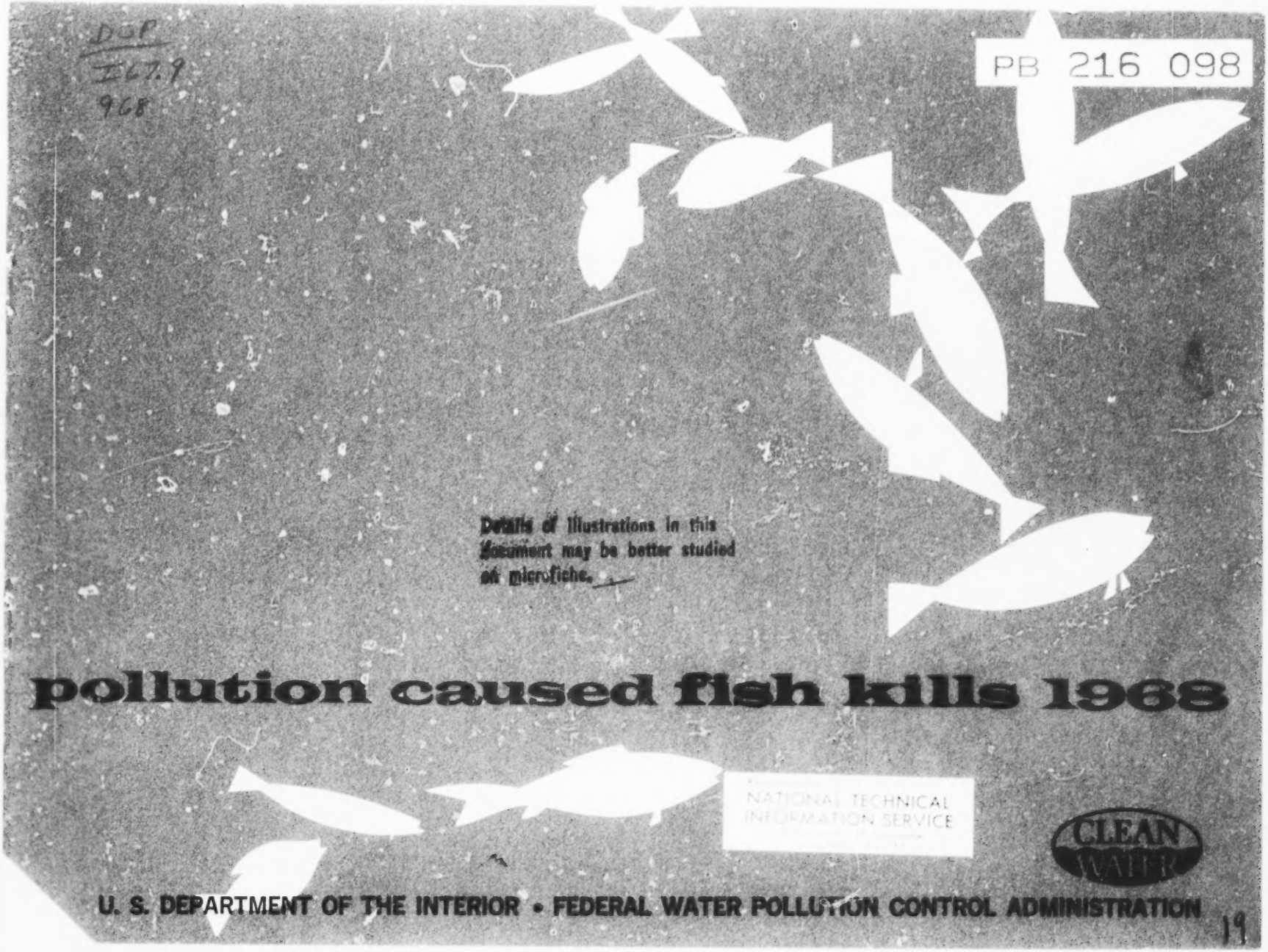

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pollution caused fish kills 1968

NATIONAL TECHNICAL INFORMATION SERVICE

CLEAN WATER

U. S. DEPARTMENT OF THE INTERIOR • FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

pollution caused fish kills - 1968

ninth annual report

PREPARED BY THE OFFICE OF PUBLIC INFORMATION, FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, WASHINGTON, D.C. 20242

The annual census of fish kills began in June 1960, and since that time a total of 103,380,060 fish have been reported killed in 2,830 incidents.

In 1968 alone, an estimated 15,236,000 fish were reported killed in 42 States by identifiable pollution sources. This was an increase of 3,645,000, or 31 percent, over 1967, when 11,591,000 fish were killed in 40 States.

Of the 438 reports of definite fish kills by pollution, only 379 specified the number of fish killed. Another 107 fish kills were reported, but the causes of these deaths could not be determined, although pollution was suspected in a number of the cases.

Improved reporting practices, variations in weather, or other factors could be partially responsible for the increased number of fish kills reported.

The largest fish kill in 1968 occurred on the Allegheny River at Bruin, Pa., where 4,029,000 fish died. A petroleum refinery company's lagoon overflowed into another pond whose walls broke, releasing chemicals into a stream. Suds 6 feet high were created as the mixture flowed along the stream.

An inadequate sewage treatment plant at Mobile, Ala., caused the second largest fish kill. Effluent from an overloaded treatment plant lowered the oxygen content in a 2 mile-stretch of Dog River, suffocating 1,023,000 fish. In this same area, 8 other fish kills occurred during the year resulting in the death of 2,716,000 fish. These kills were caused by faulty operated or inadequate treatment facilities.

From its beginning, the annual fish kill census has been the result of teamwork. Without the cooperation of State fish and game officers, conservation organizations, State pollution control agencies, and outdoor writers, the report would not be effective.

This cooperation begins when fishermen, local game wardens, or other citizens spot a fish kill and report it. An accurate and complete account of the incident depends upon prompt investigation by appropriate officials.

Of the 8 States not included in the 1968 fish kill census, Arizona submitted 1 report, but the pollution was caused by unknown bacteria; and the report was not included. Georgia submitted 1 report with the source of pollution not known. Hawaii submitted 4 reports with the pollution source unknown.

There were no reports from these States: Alaska, Delaware, Maryland, Mississippi, and Vermont.

Pollution from municipal sewers and treatment plants replaced industrial wastes as the most deadly type of pollution in 1968. Wastes from cities killed a total of 6,952,000 fish in 122 separate incidents. On the other hand, industrial wastes accounted for the highest number of incidents—177—with 6,398,000 fish killed. These two categories accounted for 88 percent of all the fish killed.

Transport accidents, such as pipeline breaks or leaks, railroad or truck accidents, were the third highest category. They were responsible for 880,000 fish being killed.

"Other operations" ranked fourth in the number of fish killed, with 584,000. This category includes pollutants from such activities as highway construction and

maintenance (including weed control), airport and service station operations, and mosquito control.

The fifth category—agricultural operations—showed a significant decrease in fish killed in 1968. Farming activities were responsible for the death of 422,000 fish in 1968, compared with 1,805,000 in 1967.

The average number of fish that died per fish kill in 1968 was 6,015, a decrease from the average of 6,460 in 1967. The averages are determined after excluding all kills over 100,000 or more as not being typical.

Transportation operations had the highest average kill, with 9,155, while municipal operations were second with 7,585.

Nine percent, or 1,336,000, of the fish killed in 1968 were game species, compared with 1,806,000 game fish killed in 1967. The percentage of fish of commercial value that died rose considerably in 1968. Two-thirds, or 10,003,000, of the fish killed in 1968 were classified as commercial, compared with only 2,510,000 out of 11,591,000 in 1967.

Pollution from malfunctioning, poorly operated, or inadequate municipal sewage treatment plants was responsible for the death of 6,181,873 fish in 97 incidents.

The use of insecticides and herbicides by the various types of operations was linked to the killing of 741,660 fish. Agricultural operations were responsible for a substantial number of these deaths. Fifty-one reports on agricultural activities gave insecticides or herbicides as the cause of the fish kill. Forty-two of these reports showed a specific number of fish killed; they totaled 325,000 fish.

Fish kills in 1968 caused by pollution lasted 2.99 days, on the average, compared with 3.34 days in 1967. The average duration of the fish kills in which all fish died in 1968 was 4.33 days, almost one day longer than the 3.37 days in 1967. By source of pollution, agricultural fish kills lasted the longest—3.77 days, on the average—while "other operations" and transportation averaged almost the same—3.54 and 3.50 days, respectively. Industrial and municipal pollution kills lasted, on the average, 2.62 and 2.61 days, respectively.

Only 29.9 percent of the agricultural fish kills were classified as heavy kills, as against almost half, or 46.2 percent, of the transportation kills.

The following 5 fish kill reports were received too late to be included in the tables: Wahiawa, Hawaii—15,000 fish reported killed; Fallon, Nevada—unknown; Texas—1 report of 100,000 fish killed and a second one of an unknown number; and Florida—7,850 killed in one pollution incident.

Numerous small fish kills caused by pollution go unnoticed or unreported. Significantly large kills often are not included because of the lack of sufficient information as to whether the kills were produced by pollutants or natural causes. It is difficult and often impossible to determine the actual cause of a kill.

Although the annual census of fish kills cannot be considered complete, the report pinpoints pollution problems and alerts the public as well as officials to the importance of safeguarding our water resources by keeping dangerous substances out of them.

highlights from the reports

Crop poisoning by airplane apparently killed 45,345 fish.

Liquid rotenone used for fish eradication in drainage ditches surrounding minnow farm killed 1,000 fish.

Investigation points to suspect using endrin at rate of one gallon per acre to spray 15-acre tomato field bounded by creek and a drainage ditch for an artesian well, which also drains into creek. 10,000 fish were killed.

Copper sulphate applied to control algae in a ditch caused the death of 600 fish. Game fish killed were brown trout.

Pollution believed to have been caused by swimming pool being drained at resort. Pool was cleaned with muriatic acid and then drained into creek killing 125 fish.

Discharge of zinc cyanide from plating room of a chain company caused the death of 150 fish. 200 frogs and tadpoles 3"–9" were also killed.

Construction company installing pipeline for city water department treated pipe with chlorine and flushed it into nearby creek. More than 1,200 fish were killed.

There was a slight oil slick on the water surface. Orange grove crews were using the lake to wash and refill their spray tanks. Large barrels of Ethion were lying about the shoreline in pools of the spilled oil. 45,000 fish were killed.

The discharge of dairy waste into water led to the death of 53,000 fish valued at over $1,100. Principal fish killed were minnows.

Some 5,000 rainbow and brook trout in private pond slowly died a few days after the application of carbine herbicide to adjoining field. The eyes of the fish were white prior to death. The fish gasped and struggled at the surface before succumbing. Oxygen samples taken at the time the fish were dying were analyzed, and the water had 8 parts per million of oxygen. This is more than a sufficient amount of oxygen in water.

Accidental break in an underground pipeline killed 25,884 fish valued at $572.51.

Estimated number of fish killed was low due to ice cover on water.

The discharge of acid water from waste piles of coal shaft mine was responsible for killing 14,400 fish. Estimated dollar loss of fish life $1,940.

Break in ⅜-inch pressure gauge line at an oil company's pumping station permitted the escape of an estimated 50,000 gallons of petroleum products which collected in a depression on company property until heavy rains and a general thaw enabled the petroleum to enter a tributary of a creek. The company built straw dams, but these proved largely ineffectual because of the high water. 6,700 fish were killed.

Leak of wash water containing caustic soda and sulphuric acid occurred at a steel company resulting in death of 5,060 fish. Most were panfish.

Drainage from old strip mines and an old deep mine killed 1,000 fish. Pollutant was not identifiable, but the banks and rocks were covered with iron deposits.

About 5,000 fish were killed by discharge of pulp and paper waste products into river. Oxygen content less than 1 part per million. Temperature 80°F–81°F.

Mechanical failure of lift pump that elevates sewage into lagoons resulted in sewage being directly bypassed to stream, causing oxygen depletion. 50 fish were killed.

Chicken manure was bulldozed from hatchery house of a poultry farm after a water line in the house broke, causing the manure to be reduced to a fluid state. The liquid drained into a stream, killing 334 fish.

Pollution was first reported to the State department of health because of the contamination of a spring. 2,261 dead fish were not discovered until the ice melted on the pond. Subsecuent investigation and tests brought to light a leak in the bottom of an 8,000 gallon oil tank installed at a school. Situation may have existed all winter but the weather prevented earlier detection.

Sheep were dipped in "Copper Tox" solution (emulsified toxaphene concentrate). Solution was dumped on the ground and drained into the stream killing 1,418 fish. In addition to complete fish kill, all aquatic life was destroyed. A dead rabbit, a dead bird, and a seriously ill water snake were also found on the scene.

Accidental break in the circulation lines of an ice company caused 3,150 fish to be killed.

Two drums of untreated cyanide water were spilled on property of a chemical company, and the substance flowed into a brook, killing 1,000 fish. Company was prosecuted and fined.

When farmer rinsed his spray tank after spraying hay, a valve in the bottom of the tank was accidentally left open, and about a gallon of spray drained into stream. (Mixture of xylene, methoxychlor, malathion 00, DDT.) 303 fish were killed.

Fuel tank at oil bulk station sprang a leak during weekend and was not discovered until Monday morning. Corrective measures were taken, but the ground beneath the tank was saturated with oil, and this drained into small stream killing 550 fish.

Faulty valve on a tank truck permitted approximately 20 gallons of sulfuric acid to be spilled during unloading operations at a paper mill company. Acid drained into stream, killing 2,000 fish, and also destroyed aquatic insects and bottom life.

A detergent discharged from a chemical laboratory was definitely determined to have caused the destruction of 336 fish reported killed, although the figure is believed to have been much higher. Not only was all aquatic life in the damage zone destroyed, but domestic waterfowl as well. The trout killed had been only recently stocked in anticipation of opening day of the trout season.

New lagoon on the premises of a metal corporation is leeching large quantities of acid neutralization material into stream. Water was brownish in color in the damage zone, and the bottom was coated with brown residue. 1,095 fish were killed.

Runoff from sprinkling slag at a cement mixing site killed 1,488 fish, and damaged other aquatic life and the stream bed. The company responsible for the discharge paid for the fish that were killed.

Methyl and ethyl parathion from a crop dusting plane drifted to ponds, killing 10,000 fish.

Sewage waste backed up into a pond from treatment plant. Enriched water depleted oxygen, and 1,500 fish died.

Power plant (stream generator) boilers were reported to have been cleaned and then dumped. Four days after the incident, about 25 rough fish were found dead in one-half mile stretch along stream side. Undoubtedly this represented only a portion of the total of 100 to 200 fish that were reported killed. Trout were also reported in the kill.

Discharge of 6,000 gallons of no. 1 fuel oil, allegedly by vandals, killed 1,000 fish. Toxic substance contained in fuel oil was soluble in water.

Yellow substance flowing from settling ponds of an industrial plant into the stream killed 400 fish. The company was subsequently prosecuted and fined when the pollutant (chromium, hexavalent, and aluminum.) was identified.

Vats at an old tannery were broken open by a bulldozer, and the liquid used to tan hides was permitted to flow into the stream. Pollutant entered the stream at about 20 gallons per minute and moved very slowly downstream, killing all marine life immediately, including all bottom life. 6,714 fish died.

Muskrat dug a hole through a dike separating the waste pool from the stream, allowing the waste to enter stream. Prompt action by a fruit canning company could have prevented the fish kill. 5,054 fish were killed.

Black liquor or spent caustic which entered a stream following a breakdown in paper plant operations resulted in 1,200 fish being killed. Company was prosecuted and fined for the fish loss.

Chlorine being used in a private swimming pool nearby a stream escaped into the stream, causing the death of 577 fish. Other aquatic life in the stream was also destroyed.

Cyanide released into stream from a steel mill during a banking operation on a blast furnace killed 10,854 fish.

Canning plant wastes were overloading a municipal sewage treatment plant. Flow in excess of the designed capacity of the plant was bypassed to stream untreated, killing 3,020 fish. Sewage treatment plant improvements and industrial waste treatment facilities are under construction.

Some 460 gallons of an alkyd base paint was spilled at a chemical company. The paint entered a stream via a storm drain. Material has a high oxygen demand and depleted the oxygen content of the stream, with the result that 140 fish were killed.

Filter system at a pressure station on a pipeline was cleaned with Clorox. The discharge went through the station's sump and into a stream, killing 2,000 fish. The company was prosecuted.

Gasoline escaping from break in a pipeline flowed into a tributary of a creek and then into the main stream, killing all marine life in its path. The casualties included frogs, crayfish, salamanders, and muddlers and 62,033 fish. Efforts are being made to recover damages for the fish killed.

In transferring fuel oil from a storage tank to a tank truck, the oil spilled into a sump pump and then drained to small stream. The oil killed all minnows in stream, thus destroying the source of fish bait for many fishermen. Company responsible was prosecuted and fined. 5,000 fish were killed.

During construction of a fire escape, a front-end loader, loaded with concrete, **was driven into a stream, and** then driven to five piers being built on the bank. Concrete was spilled into the stream, and evidence points to the loader being cleaned in the stream. Five feet above the job live fish were observed. 2,205 fish were killed below the site.

Condenser failure in an experimental laboratory at a refrigeration equipment plant discharged ammonia into a storm sewer. Ammonia flowed into a stream, killing 2,397 fish.

Bulldozer owned by a power line erection company tore open an 8-inch pipeline, causing fuel oil to flow into a stream. Water flow was very low. 375 fish were killed.

Excessive amounts of chemical dispersant were used to remove heating oil, killing 100 fish.

Apparently heavy rains scoured industrial and municipal effluents from creek and brought about a low dissolved oxygen slug in the fork of the river, killing 28,900 fish.

Municipal sewage was bypassed to a stream during the period an interceptor was relocated to permit the construction of a new bridge. This resulted in oxygen depletion in the stream, killing 266 fish.

Tank trucks hauling chemicals were washed out and liquid waste entered creek giving the water a red color. Material killed snakes, frogs, snails, and insects in addition to 1,192 fish.

Fuel hose was severed by a locomotive, and 8,500 gallons of diesel oil escaped to a stream, killing 2,864 fish.

Stove oil from a break in a pipeline killed 50,000 fish. The kill took place in about 10 miles of stream and partial kill in an additional 5 miles of stream. This oil (similar to diesel fuel) killed the weeds along the banks of the stream for 6 miles. Frogs, crayfish, tadpoles, snakes, and horseflies were also seen dead in the upper portion of the damage area.

Caustic cleaner, used to wash down motors at a truck terminal, was flushed into a storm sewer instead of the sanitary sewer system, killing 3,272 fish.

Quantity of endrin was washed into a run from a nearby orchard which had been sprayed. Residents in the area had seen dead fish on several previous occasions, and it appears that there were few fish present to be killed. 12 fish were killed. The orchard owners had been prosecuted previously for the same type of pollution.

Operator of a poultry-slaughtering farm emptied lagoons to free a mired tractor, with the result that 425 fish were killed. Legal proceedings against company begun.

Drainage from a solid waste disposal operation killed 150 fish. The State department of public health took action to require the city to correct the problem.

Diversion gate on a drain failed, causing overflows containing cyanide from city sewerage system. The city immediately took steps to replace the gate. 500 fish were killed.

Two gallons of malathion-dieldrin insecticide were passed through a trickling filter to kill filter flies. 500 fish were killed downstream.

Drainage from the largest completed automated chicken egg plant in the world entered stream and killed all fish. 490 fish died.

When meat-packing and slaughterhouse plant was closing down operations—dismantled refrigeration unit—anhydrous ammonia refrigerant was released into plant sewer and flushed with water into river. 250,000 fish were killed.

Barge lost some heavy crude oil which lodged under docks. An emulsifier was used to clean out the oil and prevent a fire hazard. 500 fish were killed.

Organic matter discharged by a corporation into bottom of lake near dam killed 176,000 fish. Material came through turbines, causing large drop in oxygen in river below dam.

Oil tank car overturned in railroad wreck and spilled its contents into stream. The stream flows through a commercial fish hatchery; 177,000 fish were killed. Railroad involved paid the hatchery operator for all fish destroyed. The company also took steps to clean up the oil from the banks of the stream.

Underground salt water deposits emptied into river, killing 180,000 fish. Fish kill occurred approximately 7 days prior to investigation.

MAJOR KILLS—100,000 OR OVER

LAKE OR STREAM	NEAR OR IN	NUMBER OF FISH	OPERATION
Allegheny River	Bruin, Pennsylvania	4,028,884	Petroleum
Dog River	Mobile, Alabama	1,023,367	Sewerage system
Des Moines River	Des Moines, Iowa	1,000,000	Sewerage system
Dog River	Mobile, Alabama	650,000	Sewerage system
Dog River	Mobile, Alabama	463,063	Sewerage system
Dog River	Mobile, Alabama	396,836	Sewerage system
Industrial Canal-Three Mile Creek	Mobile, Alabama	378,000	Sewerage system
Dog River	Mobile, Alabama	358,000	Sewerage system
Dog River	Mobile, Alabama	343,711	Other
Dog River	Mobile, Alabama	289,404	Sewerage system
Sandusky River	Sandusky Co., Ohio	250,585	Thermal
Boise River	Boise, Idaho	250,000	Food products
Timnath Lake & Ditch	Timnath, Colorado	250,000	Water system
Dog River	Mobile, Alabama	220,000	Sewerage system
Horseshoe Lake	Granite City, Illinois	211,872	Chemicals
Little Arkansas River	Valley Center, Kansas	206,000	Other industrial
Dog River	Mobile, Alabama	198,545	Other
W. Br. Huron River	Huron Co, Ohio	195,426	Petroleum
Shy Beaver Creek & Raystown Br. Juniata River	Cherryton, Pennsylvania	193,794	Pipeline transportation
Muskingum River	Muskingum Co, Ohio	186,068	Paper products
Licking River	Licking Co, Ohio	184,763	Metals
Cimarron River	Perkins, Guthrie, Oilton, Coyle, Oklahoma	180,000	Pipeline transportation
Crooked Run	Ferndale, Pennsylvania	177,000	Rail transportation
Cumberland River	Nashville, Tennessee	176,000	Chemicals
Dog River	Mobile, Alabama	175,215	Sewerage system
Dog River	Mobile, Alabama	163,620	Sewerage system
Industrial Canal-Three Mile Creek	Mobile, Alabama	146,500	Sewerage system
Dog Run	Mobile, Alabama	135,243	Sewerage system
Appomattox River	Petersburg, Virginia	101,463	Sewerage system
Big Sioux River	Sioux City, Iowa & South Dakota	100,000	Poisons
James River	Chesterfield Co, Virginia	100,000	Sewerage system

1—Historical summary of pollution-caused fish kills, June 1960—December 1968

JUNE-DECEMBER	1960	1961	1962	1963	1964	1965	1966	1967	1968
Number of States reporting	36	45	37	38	40	44	46	40	42
Number of reports	286	411	381	436	485	531	436	375	438
Reports which state number of fish killed	149	263	233	300	385	446	372	303	379
Total estimated number of fish killed**	6,379,000*	15,910,000*	7,118,000*	7,860,000	18,387,000	11,784,000	9,115,000	11,591,000	15,236,000**
Average size of kill ***	2,925	6,535	5,710	7,775	5,490	4,310	5,620	6,460	6,015
Largest kill reported	5,000,000	5,387,000	3,180,000	2,000,000	7,887,000	3,000,000	1,000,000	6,549,000	4,029,000
Reports where extent of area affected was stated									
River									
Number of reports	189	240	259	271	339	292	251	219	264
Miles of stream	1,204	1,686	1,448	2,203	1,440	1,300	989	1,039	1,565
Lakes and reservoirs									
Number of reports	25	50	25	49	57	38	46	33	37
Acres affected	1,407	5,967	2,581	5,644	12,637	4,630	21,564	1,996	2,400
Average duration of kill in days	**2.95**	**2.64**	**2.59**	**3.18**	**2.44**	**2.57**	**2.71**	**3.34**	**2.99**

* After adjustment for reports giving two or more causes.
** Includes all fish killed as reported plus an allowance computed for reports which do not indicate the number of fish that died.
*** Derived after excluding 31 reports of 100,000 kills or more as being unrepresentative.

2—Fish kill summary by source of pollution

SOURCE OF POLLUTION	TOTAL REPORTS	REPORTED FISH KILLED		AVERAGE KILL*	ESTIMATED FISH KILLED**			
		NUMBER OF REPORTS	NUMBER OF FISH		TOTAL	GAME	NONGAME	COMMERCIAL
Agricultural operations	77	66	375,548	4,240	422,000	152,000	270,000	277,000
Industrial operations	177	152	6,255,713	5,675	6,398,000	415,000	5,983,000	2,349,000
Municipal operations	122	108	6,791,464	7,585	6,952,000	320,000	6,632,000	6,558,000
Transportation operations	39	33	825,365	9,155	880,000	430,000	450,000	244,000
Other operations	23	20	578,124	1,995	584,000	19,000	565,000	575,000
Total	**438**	**379**	14,826,214	**6,015**	**15,236,000**	**1,336,000**	**13,900,000**	**10,003,000**

* Derived after excluding 31 reports of 100,000 kills or more as being unrepresentative.
** Includes all fish killed as reported plus an allowance computed for reports which do not indicate the number of fish that died.

3—Pollution-caused fish kill summary by State

STATE	TOTAL REPORTS	REPORTED FISH KILLED		EXTENT OF DAMAGE					
				RIVER		LAKE		SHORE	
		NO. OF REPORTS	NO. OF FISH	NO. OF REPORTS	MILES	NO. OF REPORTS	ACRES	NO. OF REPORTS	MILES
Alabama	28	28	5,211,703	24	84	1	16	—	—
Arkansas	16	8	74,345	3	18	6	46	1	2
California	14	14	31,255	10	36	2	9	—	—
Colorado	2	2	250,075	—	—	1	1	1	8
Connecticut	11	11	37,150	8	9	—	—	—	—
Florida	4	3	45,800	1	1	1	2	—	—
Idaho	2	2	255,000	1	15	1	3	—	—
Illinois	9	9	362,680	8	40	1	1,187	—	—
Indiana	13	9	12,119	11	95	—	—	—	—
Iowa	6	6	1,068,700	6	109	—	—	—	—
Kansas	12	12	368,000	12	91	—	—	—	—
Kentucky	4	1	5,000	4	26	—	—	—	—
Louisiana	4	4	10,750	4	24	—	—	—	—
Maine	4	3	17,000	4	11	—	—	—	—
Massachusetts	5	2	1,100	1	5	2	90	—	—
Michigan	12	11	21,607	1	1	—	—	—	—
Minnesota	10	6	6,900	9	99	—	—	—	—
Missouri	15	11	16,384	14	47	1	3	—	—
Montana	1	—	—	—	—	—	—	—	—
Nebraska	7	5	7,050	2	27	2	10	—	—
Nevada	1	1	2,000	—	—	1	1	—	—
New Hampshire	4	3	3,400	1	1	2	51	—	—
New Jersey	8	8	53,650	6	11	2	18	—	—
New Mexico	2	2	13,000	2	12	—	—	—	—
New York	11	9	21,105	10	14	—	—	—	—
North Carolina	7	7	26,500	7	71	—	—	—	—
North Dakota	1	1	500	1	7	—	—	—	—
Ohio	66	66	1,112,277	—	—	—	—	—	—
Oklahoma	7	6	189,550	2	91	4	28	—	—
Oregon	7	5	5,450	5	16	1	7	—	—
Pennsylvania	53	52	4,542,374	50	196	2	14	—	—
Rhode Island	2	2	5,300	—	—	1	250	—	—
South Carolina	2	2	64,609	2	34	—	—	—	—
South Dakota	3	2	105,000	3	20	—	—	—	—
Tennessee	16	11	312,268	9	59	1	1	2	15
Texas	30	18	57,573	14	150	2	574	2	3
Utah	5	5	11,418	1	7	—	—	—	—
Virginia	17	16	336,759	14	50	2	87	—	—
Washington	3	3	79,052	2	4	1	2	—	—
West Virginia	7	7	70,800	5	56	—	—	—	—
Wisconsin	6	5	10,761	6	26	—	—	—	—
Wyoming	1	1	250	1	2	—	—	—	—
Total	**438**	**379**	**14,826,214**	**264**	**1,565**	**37**	**2,400**	**6**	**28**

* Duplicate report submitted by Iowa and South Dakota was reported under South Dakota in the above listing.
NOTE—Eight States not included either because they did not submit a report or their reports did not identify source of pollution.

4—Fish kill summary by source of pollution

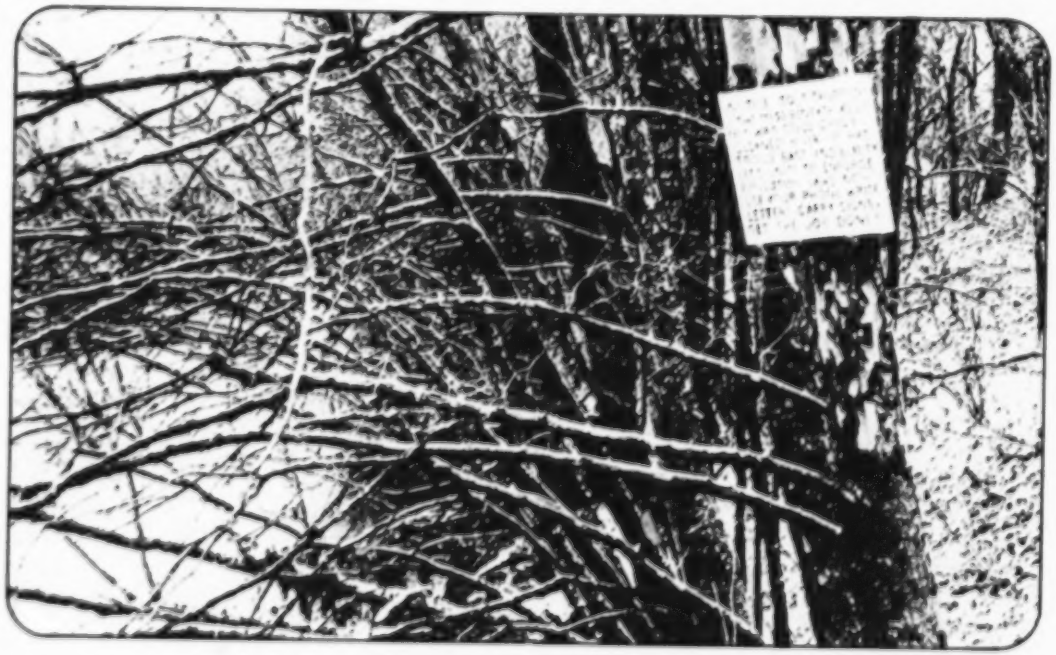
SOURCE OF POLLUTION	TOTAL REPORTS	REPORTED FISH KILLED	
		NUMBER OF REPORTS	NUMBER OF FISH
AGRICULTURAL			
Insecticides, poisons, etc.	51	42	325,194
Fertilizers	5	5	15,116
Manure-silage drainage	21	19	35,238
Subtotal	77	66	375,548
INDUSTRIAL			
Mining	21	20	82,657
Food and kindred products	35	28	450,074
Paper and allied products	8	8	203,329
Chemicals	39	33	731,881
Petroleum	22	18	4,272,962
Metals	18	17	252,598
Combinations	3	3	3,200
Others	31	25	259,012
Subtotal	177	152	6,255,713
MUNICIPAL			
Sewerage systems	97	86	6,181,873
Refuse disposal	3	3	3,934
Water systems	11	10	336,190
Swimming pool	4	4	1,232
Power	7	5	268,235
Subtotal	122	108	6,791,464
TRANSPORTATION			
Rail	10	8	283,937
Truck	5	5	6,003
Barge or boat	9	9	1,839
Pipeline	15	11	533,586
Subtotal	39	33	825,365
OTHER OPERATIONS	23	20	578,124
Total	438	379	14,826,214

5—Fish kill summary by type of water body

TYPE OF WATER BODY	TOTAL REPORTS	REPORTED FISH KILLED		EXTENT OF DAMAGE					
		NO. OF REPORTS	NO. OF FISH	MILES OF RIVER		ACRES OF LAKE		MILES OF SHORE	
				NO. OF REPORTS	MILES	NO. OF REPORTS	ACRES	NO. OF REPORTS	MILES
River	377	328	14,090,571	264	1,565	—	—	—	—
Lake	57	48	734,043	—	—	37	2,400	—	—
Bay	4	3	1,600	—	—	—	—	6	28
Total	**438**	**379**	**14,826,214**	**264**	**1,565**	**37**	**2,400**	**6**	**28**

6—Fish kill summary by water type

TYPE OF WATER	TOTAL REPORTS	REPORTED FISH KILLED	
		NUMBER OF REPORTS	NUMBER OF FISH
Fresh	409	353	9,869,851
Salt	6	4	1,888
Estuary	23	22	4,954,475
Total	**438**	**379**	**14,826,214**



7—Fish kill summary by month

MONTH	REPORTED FISH KILLED		
	TOTAL REPORTS	NUMBER OF REPORTS	NUMBER OF FISH
January	20	15	765,819
February	14	12	88,854
March	18	17	68,894
April	24	23	320,467
May	23	17	80,127
June	43	33	211,333
July	80	71	1,607,403
August	61	51	1,984,450
September	73	67	3,381,566
October	56	52	5,204,124
November	14	12	1,049,570
December	7	6	16,312
Not Stated	5	3	47,295
Total	**438**	**379**	**14,826,214**

8—Severity of fish kills by duration

DAYS	ALL REPORTS*	COMPLETE KILL	HEAVY KILL	MODERATE KILL	LIGHT KILL	NOT STATED
Less than 1	31	6	10	7	7	1
1	78	8	37	13	15	5
2	57	12	25	11	6	3
3	28	3	9	10	6	—
4	13	1	7	2	3	—
5	14	3	8	1	—	2
6	3	1	1	—	1	—
7	9	—	4	3	2	—
8	2	1	—	—	1	—
10	2	1	1	—	—	—
11	2	1	—	1	—	—
12	1	—	—	1	—	—
14	3	—	1	1	1	—
15	1	1	—	—	—	—
30	4	2	1	—	1	—
60	1	1	—	—	—	—
Total	**249**	**41**	**104**	**50**	**43**	**11**
Average	**2.99**	**4.33**	**2.64**	**2.80**	**3.09**	**2.00**

* Includes only reports which indicated duration of kill.

9—Fish kill summary by severity of kill

SEVERITY OF KILL	TOTAL REPORTS	REPORTED FISH KILLED		ESTIMATED NO. OF FISH KILLED**	AVERAGE KILL*
		NO. OF REPORTS	NO. OF FISH		
Complete kill	53	48	768,491	802,000	6,795
Heavy kill	133	110	7,270,006	7,551,000	12,205
Moderate kill	85	71	345,319	385,000	2,840
Light kill	70	62	4,089,992	4,098,000	1,005
Not stated	97	88	2,352,476	2,400,000	5,295
Total	**438**	**379**	**14,826,214**	**15,236,000**	**6,015**

* Derived after excluding 31 reports of 100,000 kills or more as being unrepresentative.
** Includes all fish killed as reported plus an allowance for reports which do not indicate the number of fish that died.

10—Severity of fish kills by source of pollution

SOURCE OF POLLUTION	ALL REPORTS	COMPLETE KILL	HEAVY KILL	MODERATE KILL	LIGHT KILL	NOT STATED
Distribution by number						
Agricultural operations	77	12	23	18	10	14
Industrial operations	177	25	45	38	28	41
Municipal operations	122	7	40	25	24	26
Transportation operations	39	4	18	3	3	11
Other	23	5	7	1	5	5
Total	**438**	**53**	**133**	**85**	**70**	**97**
Percentage Distribution						
Agricultural operations	100.0	15.6	29.9	23.3	13.0	18.2
Industrial operations	100.0	14.1	25.4	21.5	15.8	23.2
Municipal operations	100.0	5.7	32.8	20.5	19.7	21.3
Transportation operations	100.0	10.2	46.2	7.7	7.7	28.2
Other	100.0	21.7	30.5	4.4	21.7	21.7
Total	**100.0**	**12.1**	**30.4**	**19.4**	**16.0**	**22.1**

11—Distribution of pollution source of fish kills by duration

DAYS	ALL REPORTS*	AGRICULTURAL OPERATIONS	INDUSTRIAL OPERATIONS	MUNICIPAL OPERATIONS	TRANSPORTATION OPERATIONS	OTHER OPERATIONS
Less than 1	31	4	14	8	1	4
1	78	14	27	23	8	6
2	57	12	27	14	4	—
3	28	9	11	5	2	1
4	13	4	4	3	2	—
5	14	3	7	1	2	1
6	3	—	1	—	2	—
7	9	2	3	3	1	—
8	2	—	—	2	—	—
10	2	1	—	—	1	—
11	2	—	1	1	—	—
12	1	—	—	1	—	—
14	3	1	1	—	1	—
15	1	—	—	1	—	—
30	4	2	1	—	—	1
60	1	—	—	—	—	1
Total	**249**	**52**	**97**	**62**	**24**	**14**
Average	**2.99**	**3.77**	**2.62**	**2.61**	**3.50**	**3.54**

* Includes only reports which indicated duration of kill.

REPORT OF POLLUTION CAUSED FISH KILLS

RIVER OR LAKE — CITY OR TOWN — DATE

CAUSE (Fish Icon Below)

TYPE: % GAME — % NON GAME

COMMERCIAL FISH LOSS(%)

ESTIMATED FISH KILLED

SEVERITY: (1) Complete — (2) Heavy — (3) Moderate — (4) Light

ESTIMATED MILES OR ACRES AFFECTED

DURATION: DAY — HOUR

ALABAMA	BLACK WARRIOR RIV	BIRMINGHAM	7	11	68	31	41%	59%	12%	28,900		2			1H	-	-
	WHITFIELD CANAL	DEMOPOLIS	8	12	68	42	76%	24%	24%	1,192	1				2M	1	-
	LAKE DEMOPOLIS	DEMOPOLIS	8	25	68	11	28%	72%	72%	15,369		2			15A	6	-
	TOMBIGBEE RIVER	MCINTOSH	6	17	68	24	80%	20%	3%	90,000		2			5M	1	-
	TOMBIGBEE RIVER	MCINTOSH	6	28	68	24	36%	64%	-	51,246		2			7M	2	-
	DOG RIVER	MOBILE	5	19	68	31	1%	99%	99%	52,780		2			1A	-	-
	DOG RIVER	MOBILE	7	11	68	31	0%	100%	100%	135,243		2			9A	1M	-	18
	DOG RIVER	MOBILE	7	17	68	50	1%	99%	99%	343,711		2				1M	3	-
	DOG RIVER	MOBILE	7	30	68	51	1%	99%	99%	198,545		2				1M	1	-
	DOG RIVER	MOBILE	7	30	68	51	0%	100%	100%	356,836		2				1M	4	-
	DOG RIVER	MOBILE	8	4	68	51	0%	100%	100%	284,404		2				1M	-	12
	DOG RIVER	MOBILE	8	6	68	51	2%	98%	98%	665,063		2				3M	2	-
	DOG RIVER	MOBILE	8	15	68	51	1%	99%	99%	25,700		2				3M	1	-
	DOG RIVER	MOBILE	8	29	68	51	0%	100%	100%	222,231		2				2M	1	-
	DOG RIVER	MOBILE	9	4	68	51	0%	100%	99%	356,000		2				1M	1	-
	DOG RIVER	MOBILE	9	5	68	51	0%	100%	100%	2,023,367		2				4M	1	-
	DOG RIVER	MOBILE	9	27	68	51	0%	100%	100%	850,000		2				1M	1	-
	DOG RIVER	MOBILE	9	28	68	51	0%	100%	100%	2,451				4		1M	1	-
	DOG RIVER	MOBILE	10	4	68	51	0%	100%	99%	179,215		2				1M	1	-
	DOG RIVER	MOBILE	10	7	68	51	1%	99%	99%	161,620		2				4M	1	-
	DOG RIVER	MOBILE	11	25	68	51	0%	100%	100%	27,500		2				1M	1	-
	THREE MILE CREEK	MOBILE	8	12	68	31	2%	100%	100%	6,900	1					2M	-	-
	THREE MILE CREEK	MOBILE	9	6	68	51	0%	100%	100%	142,500						-	1	-
	THREE MILE CREEK	MOBILE	9	17	68	51	0%	100%	100%	118,200		2				-	1	-
	CHICKASAW CREEK	MOBILE	9	25	68	23	1%	99%	99%	9,913				4		2M	1	-
	SOUGAHATCHEE CK	NOTASULGA	6	17	68	25	50%	50%	-	5			3			25M	5	-
	CEDAR CREEK	RUSSELLVILLE	7	25	68	11	23%	80%	40%	3,225			-			3M	5	-
	BLACK WARRIOR RIV	TUSCALOOSA	10	1	68	24	27%	73%	72%	385			3			3M	2	-
ARKANSAS	OSAGE CREEK	BERRYVILLE	8	20	68	31	70%	30%	-	-			3			3M	2	-
	OSAGE CREEK	BERRYVILLE	9	25	68	31	-	-	-	-				-		-	-	-
	BELCOE LAKE	DUMAS	7	22	68	11	90%	10%	-	-		2				5A	3	-
	WALNUT LAKE	DUMAS	7	15	68	11	3%	100%	-	1,000				4		1A	5	-
	GRAND LAKE	EUDORA	5	9	68	11	17%	9%	-	-			3			-	-	-
	GRAND LAKE	EUDORA	9	16	68	11	43%	57%	-	8,000			3			5A	-	-
	MISSISSIPPI RIVER	HELENA	6	5	68	24	0%	100%	-	-				4		15A	2	-
	LITTLE RIVER	HORATIO	9	19	68	28	-	-	-	3,000	1					-	-	-
	OLD RIVER LAKE	HORATIO	10	15	68	28	-	-	-	-				-		-	-	-
	LAKE CHICOT	LAKE VILLAGE	8	10	68	11	60%	40%	-	15,345		2				15A	-	5
	VILLAGE CREEK	NEWPORT	8	13	68	24	-	-	-	-				-		-	-	-
	EIGHT MILE CREEK	PARAGOULD	5	2	68	36	26	96%	-	1,000			3			8M	-	-
	LAKE NIMROD	PLAINVIEW	1	29	68	28	20%	80%	80%	-		2				4M	2	-
	BAYOU BARTHOL RW	STAR CITY	9	27	68	11	90%	10%	-	10,000			3			1M	-	12
	LAKE ENTERPRISE	WILMOT	11	5	68	28	50%	50%	-	2,000				4		5A	7	-
	LAKE ENTERPRISE	WILMOT	11	21	68	28	40%	60%	-	4,000			3			5A	2	-
CALIFORNIA	BEAR CREEK	ALPINE MEADOWS	7	22	68	33	100%	0%	-	180				4		-	8	-
	MAD RIVER	ARCATA	10	11	68	28	98%	2%	-	10,000		2				2M	1	-
	UPPER E SIDE DRAIN	BLYTHE	2	22	68	11	25%	75%	-	5,000		2				4M	2	-
	CARNADERO CREEK	GILROY	4	-	68	11	10%	90%	-	10,000	1					24M	-	-
	NEV IRRIGATN DITCH	GRASS VALLEY	4	5	68	50	100%	0%	-	600	1					6M	-	-
	KINGS RIVER	HANFORD	9	23	68	11	56%	44%	-	2,250		2				2M	-	-
	UPPER KELSEY CR	LAKEPORT	5	6	68	34	60%	40%	-	125	1					2M	-	-
	REDWOOD CREEK	NAPA	5	8	68	33	81%	19%	-	2,530	1					1M	-	-
	OLNEY CREEK	REDDING	10	13	68	26	75%	25%	-	450			3			1M	-	-
	STANISLAUS RIVER	RIVERBANK	10	17	68	26	95%	5%	-	50		2				3M	1	-
	STENNER CREEK	SAN LUIS OBISPO	1	12	68	33	50%	50%	-	1,200		2				-	-	-
	STOCKTON HARBOR	STOCKTON	8	2	68	22	90%	10%	-	900				4		5A	3	-
	UNNAMED FARM POND	THERMALITO	9	15	68	11	20%	80%	-	300		2				4A	2	-
	ALAMEDA CREEK	UNION CITY	1	16	68	26	100%	0%	-	150	1					1M	-	-
COLORADO	RIO GRANDE-PONDS	CREEDE	5	16	68	21	100%	0%	-	75	1					1A	2	-
	TIMNATH LK-DITCH	TIMNATH	10	5	68	33	0%	100%	-	230,000		2				8M	-	-
CONNECTICUT	HOXIE BROOK	FRANKLIN	8	2	68	43	5%	95%	-	700		2				-	-	-
	HUBBARD BROOK	GLASTONBURY	5	11	68	33	95%	5%	-	650			3			-	-	-
	THAMES RIVER	GROTON	9	28	68	28	0%	100%	-	700			3			1M	-	-
	QUINNIPIAC RIVER	MERIDEN	6	19	68	31	3%	100%	-	300				4		2M	-	-
	NORWALK RIVER	NORWALK	8	17	68	24	0%	100%	-	12,500			3			1M	-	-
	QUINNIPIAC RIVER	PLANTSVILLE	7	11	68	24	0%	100%	-	700			3			1M	-	-
	GOFF BROOK	ROCKY HILL	11	8	68	31	2%	100%	-	5,500		2				4M	-	9
	STOUGHTON BROOK	SOUTH WINDSOR	8	12	68	27	0%	100%	-	100				-	1A	1M	-	-
	QUINNIPIAC RIVER	SOUTHINGTON	9	17	68	24	0%	100%	-	8,500			3			1M	-	-
	TUMBLE BR-2 PONDS	WEST HARTFORD	4	21	68	11	0%	100%	-	2,500				-		-	-	-
	CONNECTICUT RIVER	WINDSOR LOCKS	7	17	68	26	1%	99%	-	7,000			3			1M	-	-
FLORIDA	LAKE HENDRY	FORT MEADE	4	-	68	11	50%	50%	-	45,750		2				-	7	-
	PRIVATE LAKE	LEESBURG	10	18	68	11	50%	50%	-	700			3			2A	3	-
	MARGATE CANAL	MARGATE	1	23	68	50	100%	0%	-	100				4		1M	1	-
	LAKE BUCKEYE	WINTER HAVEN	8	19	68	11	5%	95%	-	-			3			-	8	-
IDAHO	BOISE RIVER	BOISE	4	3	68	22	3%	96%	-	450,000	1					15M	-	15
	PRIVATE POND	GENESEE	5	26	68	11	100%	0%	-	5,000	1					5A	10	-
ILLINOIS	RICHLAND CREEK	BELLEVILLE	7	12	68	21	79%	21%	20%	550				4		1M	3	-
	STUCKY BRANCH	PIATT	9	22	68	21	13%	90%	-	9,690	1					3M	2	-
	SOUTH EDWARDS RIV	SALVA-BISHOP HIL	9	12	68	31	5%	94%	12%	22,575		2				8M	5	12
	HORSESHOE LAKE	GRANITE CITY	1	30	68	24	8%	92%	8%	21,872		2			1167A	3	-	
	MUD RUN-CAMP RUN	PRINCEVILLE	9	23	68	22	14%	81%	12%	23,593	1					6M	5	-
	ROCK RUN	ROCK CITY	6	5	68	22	1%	99%	3%	41,500		2				6M	-	-
	HOWLAND CREEK	ROCK FALL-HARMN	1	25	68	44	1%	99%	1%	25,884		2				8M	2	-
	MACOUPIN CREEK	STANDARD CITY	5	5	68	21	41%	59%	24%	24,400			3			5M	2	-
	MARYS RIVER	STELLEVILLE	9	19	68	21	100%	0%	-	675				4		5M	-	-

OPERATIONS CODES (CAUSE): 10 Agricultural Operations. 11 Persons (Herbicides, Pesticides, etc.) 12 Fertilizers. 13 Manure, Silo, Feedlot Drainage, etc. **20 Industrial Operations.** 21 Mining. 22 Food & Kindred Products. 23 Paper & Allied Products. 24 Chemicals. 25 Petroleum. 26 Metals. 27 Combinations. 28 Other. **30 Municipal Operations.** 31 Sewerage System. 32 Refuse Disposal. 33 Water System. 34 Swimming Pool. 35 Power. **40 Transportation Operations.** 41 Rail. 42 Truck. 43 Barge or Boat. 44 Pipe Line. **50 Other Operations.** 90 Unknown (See table, page 16)

REPORT OF POLLUTION CAUSED FISH KILLS

	RIVER OR LAKE	CITY OR TOWN	DATE	CAUSE (SEE CODE PAGE 11)	TYPE % GAME	TYPE % NON-GAME	COMMERCIAL FISH LOSS(%)	ESTIMATED FISH KILLED	SEVERITY Complete (1)	SEVERITY Heavy (2)	SEVERITY Moderate (3)	SEVERITY Light (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION DAY	DURATION HOUR
INDIANA	e FK WHITE RIVER	ANDERSON	10 6 68	31	1%	99%	-	266			3		1M	2	-
	MOOTS CREEK	PRINCETON	1 22 68	23	53%	47%	-	5,700			3		-	2	-
	LEATHERMAN BRANCH	CLINTON FALLS	7 16 68	44	-	-	-	-				1	15M	2	-
	BUCK CR-E BLUE R	DUNKEITH	1 1 68	41	-	-	-	-					15M	2	-
	SO FK WILDCAT CR	FRANKFORT	8 21 68	31	1%	99%	-	1,020		2			5M	5	-
	HENDERSON CREEK	GRAW ROAD	5 25 68	42	94%	6%	-	72				2	-	7	-
	BRANDYWINE CREEK	GREENFIELD	9 13 68	24	12%	88%	-	14			3		2M	3	-
	WHITE RIVER	MUNCIE	9 5 68	31	19%	81%	-	532		2			3M	3	-
	BEAR CREEK	RIDGEVILLE	9 30 68	13	83%	17%	-	262		2			1M	1	-
	SIX MILE CREEK	SHIRLEY	6 20 68	22	-	-	-	-		2			5M	1	-
	RIPLEY CREEK	SUNMAN	8 31 68	31	-	-	-	-					20M	1	-
	RICHLAND CREEK	WHITEHALL	9 4 68	23	8%	92%	-	84			3		5M	1	-
	TURKEY CREEK	WINDFALL	8 1 68	31	54%	46%	-	743				4	15M	1	-
IOWA	DES MOINES RIVER	DES MOINES	11 - 68	31	5%	95%	-	1,400,000					40M	2	-
	DES MOINES RIVER	FARMINGTON	7 21 68	31	0%	100%	-	300				4	7M	2	-
	TIPTON CREEK	HUBBARD	9 5 68	31	5%	95%	-	1,000			3		2M	2	-
	IOWA RIVER	IOWA FALLS	8 - 68	22	1%	99%	-	15,000		2			20M	2	-
	FLOYD RIVER	SIOUX CITY	7 - 68	24	2%	98%	-	21,000		2			40M	1	-
	LITTLE SIOUX	SPENCER-FLYNN CR	11 - 68	31	5%	95%	-	25,000		2			50M	1	-
KANSAS	DURFEHEN CREEK	FAIRWAY	7 28 68	44	50%	50%	60%	50,000	1				15M	6	-
	COTTONWOOD RIVER	EMPORIA	5 31 68	13	1%	99%	65%	20,000		2			2M	1	12
	KANSAS RIVER	EUREKA	2 12 68	24	1%	99%	20%	1,000					20M	2	-
	COW CREEK	HUTCHINSON	2 20 68	21	1%	99%	50%	10,000				1	9M	2	-
	SAND CREEK	NEWTON	3 24 68	41	25%	75%	50%	5,000		2			10M	6	-
	SAND CREEK	NEWTON	9 11 68	41	50%	75%	80%	1,000		2			10M	6	-
	S FK SOLOMON RIV	OSBORNE	8 16 68	13	90%	10%	95%	5,000		2			6M	2	-
	E BR MILEMANS CR	TOWANDA	4 20 68	44	5%	95%	50%	1,000		2			12M	2	-
	LIT ARKANSAS RIV	VALLEY CENTER	9 19 68	28	50%	50%	25%	200,000	1				1M	3	-
	SLATE CREEK	WELLINGTON	10 5 68	52	30%	70%	35%	1,000	1				5M	11	-
	OWL CREEK	YATES CENTER	7 29 68	13	100%	0%	75%	1,000		2			5M	1	-
	SAND CREEK-TRIB	ZENDA	5 3 68	44	10%	90%	50%	12,000		2			8M	14	-
KENTUCKY	SNAKE CREEK	FRANKLIN	9 29 68	31	35%	65%	45%	-	1				10M	8	-
	MID FK-KENTUCKY R	HYDEN	* - 68	24	40%	60%	-	-	1				8M	1	-
	YELLOW CREEK	MIDDLESBORO	6 - 68	31	0%	100%	-	1,000	1				8M	1	-
	RALEIGH CREEK	MONTICELLO	6 - 68	21	0%	100%	-	-	1				1M	1	-
LOUISIANA	BAYOU RAPIDES	ALEXANDRIA	8 13 68	11	10%	90%	-	750			3		15M	3	-
	BAYOU CHOCTAW	BATON ROUGE	8 26 68	11	41%	59%	-	4,500		2			5M	5	-
	NEW RIVER	GONZALES	7 11 68	24	11%	89%	-	1,000	1				5M	2	-
	BAY LONG-LK NATEZ	WHITE CASTLE	8 16 68	11	40%	60%	25%	2,500	1				3M	2	-
MAINE	BRESTILE STREAM	EASTON	8 28 68	12	10%	90%	-	2,000	1				24M	30	-
	ANDROSCOGGIN RIV	LEWISTON-AUBURN	7 22 68	23	0%	100%	-	5,000		2			24M	2	-
	UNNAMED BROOK	TURNER	6 7 68	11	99%	1%	-	-	1				24M	3	-
	MEDOMAK RIVER	WALDOBORO	10 14 68	22	-	-	100%	10,000	1				3M	5	-
MASSACHUSETTS	COCHITUATE RESRVR	COCHITUATE	6 14 68	27	100%	0%	-	100			3		5A	1	-
	CAPE COD CANAL	SANDWICH	7 - 68	35	0%	100%	95%	-			3		-	11	-
	CAPE COD CANAL	SANDWICH	8 22 68	35	0%	100%	100%	-			3		-	12	-
	SUDBURY RIVER	SUDBURY	7 3 68	11	20%	80%	-	-		2			3M	3	-
	LAKE DENISON	WINCHENDON	7 10 68	11	100%	0%	-	1,000			3		85A	5	-
MICHIGAN	COON CREEK	ARMADA	10 26 68	25	10%	90%	-	11,660		2			-	-	-
	PIGEON RIVER	BIRCH LO	5 11 68	22	-	-	-	425			3		-	-	-
	CASS RIVER	CARO	10 4 68	22	1%	99%	-	2,400			3		-	-	-
	BLACK RIVER	CROSWELL	7 24 68	22	-	-	-	200					-	-	-
	BLACK RIVER	CROSWELL	9 28 68	22	11%	89%	-	72				4	-	-	-
	GRAND RIVER	GRAND RAPIDS	8 30 68	31	20%	80%	-	500				4	1M	-	-
	TITTABAWASSEE RIV	MIDLAND	11 - 68	24	0%	100%	-	5,000			3		-	-	-
	REAR RIVER	PETOSKEY	10 30 68	31	1%	99%	-	25				4	-	-	-
	FRANKLIN DRAIN	PLYMOUTH	8 6 68	32	-	-	-	150				4	-	-	-
	TROUT RIVER	SEC 16 T15N R5E	5 25 68	50	13%	87%	-	1,130				4	-	-	-
	PAINTERVILLE CR	SECS 35&36 T6S	10 23 68	50	-	-	-	-				4	-	-	-
	ECORSE CREEK	WYANDOTTE	6 18 68	31	0%	100%	-	25				4	-	-	-
MINNESOTA	BLUE EARTH RIVER	BLUE EARTH	7 16 68	22	0%	100%	-	700			3		1M	-	-
	CENTER CREEK	FAIRMONT	1 20 68	31	20%	80%	-	2,000			3		20M	-	-
	BUFFALO CREEK	GLENCOE	7 16 68	22	0%	100%	-	350			3		5M	-	-
	N BR ZUMBRO RIVER	KENYON	9 23 68	31	-	-	-	-					2M	-	-
	WATONWAN RIVER	MADELIA	1 28 68	31	5%	95%	-	200				4	2M	-	-
	SAUK RIVER	MELROSE	7 3 68	31	40%	60%	-	1,600			3		5M	-	-
	SAUK RIVER	MELROSE	7 11 68	31	-	-	-	-			3		5M	-	-
	ROOT RIVER	PRESTON	4 16 68	22	10%	90%	-	50				4	1M	-	-
	CROW RIVER	ROCKFORD	6 21 68	22	25%	75%	-	-			3		50M	-	-
	ROSEAU RIVER	ROSEAU	1 15 68	31	0%	100%	-	-				4	10M	-	-
MISSOURI	MIAMI CREEK	BUTLER	7 6 68	33	90%	10%	-	150				4	1M	-	-
	MILL CREEK	CAPET	6 8 68	24	-	-	-	-		2			7M	2	-
	LITTLE TAVERN CR	CROCKER	8 11 68	31	-	-	-	-		2			8M	7	-
	PLATTIN CREEK	CRYSTAL CITY	7 5 68	31	10%	90%	-	250				4	1M	-	-
	DRY CREEK	HAYDEN	10 28 68	44	-	-	-	-		2			2M	-	-
	FOX RIVER	KAHOKA	* - 68	32	98%	2%	-	34			3		1M	-	-
	DESENSLEBEN CREEK	LONG LANE	11 - 68	44	20%	80%	-	1,500		2			3M	-	-
	DEERWATER CREEK	MONTROSE	9 25 68	21	50%	50%	-	500			3		1M	-	-
	LAKE LILLY	MOUNTAIN GROVE	9 6 68	32	100%	0%	-	1,750		2			3A	1	-
	OLD NISHNABOTNA R	PHELPS CITY	8 13 68	22	2%	98%	-	5,000		2			7M	2	-
	STRAIGHT FORK	VERSAILLES	* - 68	25	20%	80%	-	400				4	1M	1	-

	JIM CREEK	VIENNA	1	1	68	44	-	-	-	-		2			6M	-	-
	POST OAK CREEK	WARRENSBURG	7	2	68	31	10%	90%	-	500				-	2M	-	-
	WHITE OAK CREEK	WELLSVILLE	6	25	68	24	20%	80%	-	400			3		7M	1	-
	ELKHORN CREEK	WELLSVILLE	7	16	68	24	10%	90%	-	2,000		2			2M	2	-
MONTANA	WARM SPRINGS CR	ANACONDA	12	24	68	11	100%	0%	-	-				-	-	-	-
NEBRASKA	UNNAMED GRAVL PIT	CENTRAL CITY	6	23	68	42	5%	95%	-	600		2			2A	1	-
	LAKE HASTINGS	HASTINGS	1	1	68	35	100%	0%	-	5,000			3		3A	7	-
	NO FORK NEMEHA	HUMBOLDT	7	14	68	31	-	-	-	-				-	-	-	-
	HAHN POND	JOHNSON	7	24	68	13	100%	0%	-	500			3		4A	1	-
	DRY CREEK	PLAINVIEW	3	7	68	31	0%	100%	-	50		2			9M	2	-
	E BR VERDIGRE CR	ROYAL	7	30	68	13	100%	0%	-	900				4	1A	-	4
	PEBBLE CREEK	SCRIBNER	6	10	68	31	10%	90%	75%	-		2			18M	2	-
NEVADA	INDIAN LAKES	FALLON	5	17	68	11	80%	20%	-	2,000				4	5M	1A	1	-
NEW HAMPSHIRE	CRESCENT LAKE	ACWORTH-UNITY	7	27	68	11	0%	100%	-	200				4	50A	-	-
	SQUMEGAN RIVER	MERRIMACK	1	29	68	24	-	-	100%	3,000				-	1M	1	-
	PRIVATE POND	NEWTON	6	24	68	11	-	-	-	-				4	1A	2	-
	CAIN BROOK	SEABROOK	7	22	68	11	0%	100%	-	200				4	-	2	-
NEW JERSEY	SEC NESHANIC RIV	FLEMINGTON	10	24	68	22	0%	100%	-	1,000	1				1M	2	-
	WILLOW BROOK	HOLMDEL	9	23	68	28	5%	95%	-	1,000	1				2M	4	-
	TRIB LEDGEWOOD BR	LEDGEWOOD	10	18	68	50	0%	100%	-	300	1				1M	1	-
	TOMAHAWK POND	LINDCROFT	7	26	68	12	0%	100%	-	250		2			1A	1	-
	WILLOW LAKE	LITTLE FERRY	10	4	68	31	0%	100%	-	50,000		2			17A	5	-
	ROCKAWAY RIVER	PARSIPPANY-TROY	10	21	68	31	0%	100%	-	200			3		5M	2	-
	MULHOCKAWAY CREEK	PATTENBURG	8	7	68	50	5%	95%	-	500		2			1M	1	-
	POHATCONG CREEK	WASHINGTON	7	16	68	24	0%	100%	-	400			3		1M	1	-
NEW MEXICO	PECOS RIVER	ARTESIA	2	14	68	25	30%	70%	-	12,000			3		10M	-	8
	RUIDOSO CREEK	RUIDOSO	6	30	68	31	65%	35%	-	1,000				4	2M	-	-
NEW YORK	GENESEE RIVER	AVON	9	23	68	31	0%	100%	-	-		2			2M	2	-
	BUTTERNUT CREEK	DE WITT	7	24	68	25	5%	95%	-	1,000		2			1M	-	6
	CANADAWAY CREEK	FREDONIA	9	23	68	31	0%	100%	-	3,500		2			2M	-	-
	CRESCENT CREEK	LAKEWOOD	4	11	68	33	1%	99%	-	2,000		2			1M	-	-
	MUD CREEK	NEW HARTFORD	6	6	68	26	10%	90%	-	250		2			1M	-	-
	W BR TIOUGHNOGA R	PRERIE	10	17	68	22	10%	90%	-	10,000		2			2M	1	-
	RED CREEK	RED CREEK	7	18	68	22	0%	100%	-	55			3		1M	-	-
	TRUMANSBURG CREEK	TRUMANSBURG	8	20	68	24	0%	100%	-	300				-	1M	-	-
	OATKA CREEK	WARSAW	7	18	68	26	1%	99%	-	1,000			3		-	-	-
	BLACK BROOK	WATERLOO	9	-	68	22	0%	100%	-	-		2			2M	3	-
	CHENANGO RIVER	WOODS CORNER	8	1	68	27	0%	100%	-	3,000		2			1M	-	-
NORTH CAROLINA	TAR RIVER	GREENVILLE	10	16	68	31	0%	100%	84%	250				4	10M	1	-
	SLOCUM CREEK	HAVELOCK	7	27	68	31	90%	10%	-	2,000		2			2M	2	-
	SQUIRES RUN	RICHLANDS	9	19	68	11	21%	79%	35%	750				-	1M	1	-
	LIT CONTENTEA CR	SCUFFLETON	10	24	68	31	76%	24%	15%	1,500	1				8M	2	-
	LITTLE RIVER	SPRING LAKE	8	10	68	31	35%	65%	58%	1,000			3		8M	2	-
	ROCKFISH CREEK	WALLACE	7	11	68	50	45%	55%	-	20,000		2			40M	5	-
	SWIFT CREEK	WINTERVILLE	9	17	68	31	5%	95%	70%	1,000				4	2M	1	-
NORTH DAKOTA	SOURIS RIVER	TOWNER	4	12	68	31	0%	100%	-	500	1				7M	15	-
OHIO	AUGLAIZE RIVER	ALLEN CO	10	16	68	31	-	-	-	11				-	-	-	-
	LITTLE DARBY CR	CHAMPAIGN CO	7	18	68	12	-	-	-	566				-	-	-	-
	BUCK CREEK	CLARK CO	4	23	68	28	-	-	-	50				-	-	-	-
	TODDS FORK	CLINTON CO	9	20	68	13	-	-	-	3,575				-	-	-	-
	COWAN CREEK	CLINTON CO	10	18	68	13	-	-	-	59				-	-	-	-
	INDIAN CREEK	DARKE CO	9	30	68	13	-	-	-	10				-	-	-	-
	TRIB ALUM CREEK	DELAWARE CO	6	6	68	12	-	-	-	12,000				-	-	-	-
	SCIOTO RIVER	DELAWARE CO	7	9	68	28	-	-	-	520				-	-	-	-
	PIPE CREEK	ERIE CO	1	31	68	43	-	-	-	68				-	-	-	-
	SECOND CREEK	ERIE CO	9	11	68	26	-	-	-	58				-	-	-	-
	RUSH CREEK	FAIRFIELD CO	7	27	68	11	-	-	-	444				-	-	-	-
	SCIOTO RIVER	FRANKLIN CO	4	10	68	41	-	-	-	200				-	-	-	-
	MASON RUN	FRANKLIN CO	4	22	68	26	-	-	-	1				-	-	-	-
	ALUM CREEK	FRANKLIN CO	7	5	68	31	-	-	-	32,486				-	-	-	-
	SCIOTO RIVER	FRANKLIN CO	8	21	68	31	-	-	-	29,076				-	-	-	-
	SCIOTO-OLENTNGY R	FRANKLIN CO	9	12	68	31	-	-	-	7				-	-	-	-
	SCIOTO-OLENTNGY R	FRANKLIN CO	10	3	68	31	-	-	-	10,612				-	-	-	-
	SCIOTO RIVER	FRANKLIN CO	10	24	68	31	-	-	-	700				-	-	-	-
	L MIAMI RIVER	GREENE CO	7	30	68	31	-	-	-	17				-	-	-	-
	SHAWNEE CREEK	GREENE CO	9	25	68	28	-	-	-	50				-	-	-	-
	LEATHERWOOD CREEK	GUERNSEY CO	7	8	68	21	-	-	-	30				-	-	-	-
	RANKLICK CREEK	HAMILTON CO	7	22	68	50	-	-	-	76				-	-	-	-
	OTTAWA CREEK	HANCOCK CO	5	3	68	13	-	-	-	5				-	-	-	-
	BLANCHARD RIVER	HANCOCK CO	8	28	68	31	-	-	-	13,494				-	-	-	-
	OIL DITCH	HANCOCK CO	11	11	68	43	-	-	-	2				-	-	-	-
	CESSNA CREEK	HARDIN CO	3	12	68	43	-	-	-	484				-	-	-	-
	HILLSBORO RESERVR	HIGHLAND CO	6	8	68	28	-	-	-	29				-	-	-	-
	DOUGHTY CREEK	HOLMES CO	8	7	68	22	-	-	-	225				-	-	-	-
	W BR HURON RIVER	HURON CO	8	7	68	25	-	-	-	195,426				-	-	-	-
	E BR HURON RIVER	HURON CO	9	4	68	31	-	-	-	13,946				-	-	-	-
	TRIB MARSH RUN	HURON CO	9	10	68	11	-	-	-	23,198				-	-	-	-
	DITCH E BR HURON	HURON CO	9	16	68	43	-	-	-	159				-	-	-	-
	BONNIE CREEK	HURON CO	10	13	68	31	-	-	-	10				-	-	-	-
	CROSS CREEK	JEFFERSON CO	9	11	68	21	-	-	-	3,135				-	-	-	-
	KOKOSING RIVER	KNOX CO	9	4	68	41	-	-	-	70				-	-	-	-
	LAKE ERIE	LAKE CO	9	11	68	28	-	-	-	107				-	-	-	-
	SO FK LICKING RIV	LICKING CO	3	4	68	28	-	-	-	3				-	-	-	-
	LICKING RIVER	LICKING CO	10	3	68	26	-	-	-	184,763				-	-	-	-
	MEANDER CREEK	MAHONING CO	5	3	68	21	-	-	-	57				-	-	-	-
	SUGAR CREEK	MADISON CO	7	15	68	11	-	-	-	65				-	-	-	-
	LIT SANDUSKY RIV	MARION CO	4	3	68	24	-	-	-	26,944				-	-	-	-
	ROCKY RIVER	MEDINA CO	7	12	68	31	-	-	-	933				-	-	-	-
	MUSKINGUM RIVER	MUSKINGUM CO	8	25	68	23	-	-	-	186,068				-	-	-	-
	PORTAGE RIVER	OTTAWA CO	6	7	68	26	-	-	-	2,779				-	-	-	-
	W BR MAHONING RIV	PORTAGE CO	4	29	68	28	-	-	-	305				-	-	-	-
	W BR MAHONING RIV	PORTAGE CO	7	20	68	26	-	-	-	34,777				-	-	-	-
	TR W BR MAHONING	PORTAGE CO	10	29	68	41	-	-	-	141				-	-	-	-
	BLANCHARD RIVER	PUTNAM CO	9	20	68	22	-	-	-	61,932				-	-	-	-
	OTTAWA RIVER	PUTNAM CO	9	21	68	24	-	-	-	11				-	-	-	-

REPORT OF POLLUTION CAUSED FISH KILLS

	RIVER OR LAKE	CITY OR TOWN	DATE	CAUSE (SEE CODE PAGE 11)	TYPE % GAME	TYPE % NON-GAME	COMMERCIAL FISH LOSS(%)	ESTIMATED FISH KILLED	SEVERITY Complete (1)	SEVERITY Heavy (2)	SEVERITY Moderate (3)	SEVERITY Light (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION DAY	DURATION HOUR
OHIO	AUGLAIZE RIVER	PUTNAM CO	9 22 68	24	-	-	-	12					-	-	-
	SANDUSKY RIVER	SANDUSKY CO	1 - 2 68	55	-	-	-	250,565					-	-	-
	SANDUSKY RIVER	SANDUSKY CO	9 19 68	22	-	-	-	1,516					-	-	-
	SANDUSKY RIVER	SANDUSKY CO	12 24 68	55	-	-	-	4,000					-	-	-
	WILLOW CREEK	SENECA CO	6 11 68	22	-	-	-	22					-	-	-
	LORAMIE CREEK	SHELBY CO	9 5 68	50	-	-	-	893					-	-	-
	TURTLE CREEK	SHELBY CO	10 12 68	13	-	-	-	119					-	-	-
	NELLYS CREEK	STARK CO	6 11 68	43	-	-	-	10					-	-	-
	ILG POND	STARK CO	7 24 68	31	-	-	-	191					-	-	-
	MOSQUITO CREEK	TRUMBULL CO	6 14 68	28	-	-	-	6					-	-	-
	TUSCARAWAS RIVER	TUSCARAWAS CO	8 16 68	21	-	-	-	23					-	-	-
	MILL CREEK	UNION CO	10 10 68	31	-	-	-	1,479					-	-	-
	LATT DITCH-ST JOE	WILLIAMS CO	8 5 68	43	-	-	-	572					-	-	-
	ROADDITCH-MITCHEL	WOOD CO	7 8 68	43	-	-	-	6					-	-	-
	S BR PORTAGE RIV	WOOD CO	9 13 68	22	-	-	-	1,578					-	-	-
	PORTAGE RIVER	WOOD CO	9 18 68	31	-	-	-	12,540					-	-	-
	SYCAMORE CREEK	WYANDOT CO	10 22 68	31	-	-	-	31					-	-	-
OKLAHOMA	JANSEN FARM POND	CORN-6 MILES SO	4 11 68		65%	35%	-	200			3		2A	7	-
	SEC 21 IN 7W	ELMORE CITY	2 - 68		100%	0%	-	1,600	1				16A	1	-
	LYNN WILEY F C LK	FOSTER	2 - 68		50%	50%	-	1,500		2			8A	7	-
	CIMARRON RIVER	PERKINS-GUTHRIE	1 18 68		35%	65%	40%	140,000		2			90M	6	-
	UNNAMED POND	PERRY	8 12 68		100%	0%	-	250			3		6A	1	12
	LAKE HOBART	ROCKY-1 MILE W	4 14 68		1%	99%	-	6,000				4	-	4	-
	BIG SALLISAW CR	SALLISAW	9 1 68		10%	90%	-	-			3		1M	2	-
OREGON	IRRIGATION CANAL	AUMSVILLE	9 27 68	13	-	-	-	-			3		2M	6	-
	SHELL BEACH	COLUMBIA CITY	3 20 68	24	-	-	-	50			3		1M	-	5
	WALLOWA RIVER	ENTERPRISE	9 4 68	12	100%	0%	-	300		2			1M	-	-
	UMATILLA RIVER	PENDLETON	9 - 68	28	95%	5%	-	-			3		10M	-	-
	WILLAMETTE RIVER	PORTLAND-HARBOR	2 16 68	43	5%	95%	-	500			3		2A	2	-
	MILL CREEK	THE DALLES	7 18 68	22	50%	50%	-	600	1				2M	2	-
	BORROW PIT POND	WHITE CITY	2 - 68	28	100%	0%	-	4,000	1				5A	-	-
PENNSYLVANIA	CEDAR RUN	ALLENTOWN	9 23 68	24	100%	0%	-	500			3		2M	-	4
	TROUT CREEK	ALLENTOWN	12 12 68	42	10%	90%	-	3,272		2			2M	1	-
	MONOCACY CREEK	BATH	9 24 68	22	74%	26%	-	403				4	1M	-	4
	WEST SWAMP CREEK	BECHTELSVILLE	R 23 68	50	100%	0%	-	250				4	1M	1	-
	L KISHACOQUILA CR	BELLEVILLE	4 5 68	13	95%	5%	-	334		2			1M	2	-
	SAUCON CREEK	BETHLEHEM	7 4 68	50	0%	100%	-	133				1	2M	-	12
	BOWERS RUN	BIGLERVILLE	9 16 68	22	78%	22%	-	5,054	1				1M	2	-
	ALLEGHENY RIVER	BRUIN	10 24 68	25	1%	99%	-	4,028,884				4	55M	7	-
	SNY BEAVER CR	CHERRYTOWN	9 13 68	44	50%	50%	-	193,794		2			10M	3	-
	E BR OCTARORA CR	CHRISTIANA	6 30 68	26	100%	0%	-	400		2			1M	1	-
	TRIB RICHARDS RUN	CLYDE	10 17 68	44	0%	100%	-	375		2			2M	2	-
	N BR BLACKLICK CR	COLVER	3 6 68	21	100%	0%	-	350		2			2M	2	-
	FREDERICKS POND	CONYNGHAM	* - 68	50	25%	75%	-	2,261	1				6A	60	-
	S BR SAUCON CREEK	COOPERSBURG	6 17 68	34	55%	45%	-	300		2			1M	-	2
	E BR BRANDYWNE CR	CUPOLA	6 11 68	26	70%	30%	-	5,040		2			3M	1	-
	E BR BRANDYWNE CR	CUPOLA	6 22 68	26	70%	30%	-	5,101		2			3M	1	-
	INDIAN CREEK	DANIELSVILLE	5 23 68	33	100%	0%	-	10				4	1M	-	1
	MAHONING CREEK	DANVILLE	3 26 68	42	60%	40%	-	867		2			-	1	-
	DEEP RUN	DUBLIN	7 1 68	22	95%	5%	-	-		2			6M	-	8
	INDIAN CREEK	FLORED	10 8 68	44	50%	50%	-	2,000			3		1M	-	8
	INDIAN RUN	FOMRATA	12 21 68	13	100%	0%	-	490	1				3M	1	12
	CROOKED RUN	FERNDALE	8 1 68	41	100%	0%	-	177,000		2			2M	4	-
	TRIB-COGLEY RUN	FERTIGS	7 15 68	21	90%	10%	-	1,000			3		3M	1	-
	S BR CODORUS CR	GLEN ROCK	10 2 68	50	10%	90%	-	2,205	1				1M	-	4
	DUNDERDALE CREEK	GRAND VALLEY	4 23 68	25	50%	50%	-	50				4	3M	2	-
	UNNAMED RUN	GREENSBURG	9 12 68	25	0%	100%	-	5,000	1				2M	2	6
	DARBY CREEK	HAVERFORD	9 27 68	31	100%	0%	-	300	1				2M	2	-
	TRIB TO OIL CREEK	HYDETOWN	7 1 68	11	1%	99%	-	303				4	2M	1	12
	TRIB TO CURRY RUN	INDIANA	6 10 68	25	0%	100%	-	550				4	6M	3	-
	MUDDY RUN CREEK	INTERCOURSE	6 25 68	11	99%	1%	-	1,418	1				3M	2	-
	E BR RED CLAY CR	KENNETT SQUARE	5 17 68	28	5%	95%	-	3,150				4	2M	-	2
	YELLOW BREECHS CR	LISBURN	12 8 68	11	100%	0%	-	12	1				3M	5	-
	MIDDLE CREEK	MIDDLEBURG	8 7 68	28	25%	75%	-	6,714		2			4M	2	12
	SLOAT BROOK	MILFORD	4 10 68	24	50%	50%	-	1,000				4	2M	2	-
	SEELEY CREEK	MOSHERVILLE	10 9 68	44	0%	100%	-	62,033	1				2M	1	12
	MOUNTAIN CREEK	MOUNT HOLLY SPG	6 21 68	23	100%	0%	-	2,000	1				2M	1	5
	TULPEHOCKEN CREEK	MYERSTOWN	4 9 68	24	100%	0%	-	336		2			1M	2	-
	LEHIGH CANAL	NORTHAMPTON	11 23 68	21	100%	0%	-	146		2			1M	-	3
	OIL CREEK	OIL CITY	10 9 68	24	75%	25%	-	3,500		2			2M	1	-
	LAKE WARGUS	PENN RUN	8 14 68	11	60%	40%	-	7,500		2			6A	1	-
	PENNYPACK CREEK	PHILADELPHIA	10 28 68	50	100%	0%	-	700				4	1M	-	4
	FISHING CREEK	RED LION	4 17 68	26	50%	50%	-	1,095		2			6M	1	-
	MAHONING CREEK	SPORTSBURG	8 13 68	31	1%	99%	-	2,500			3		3M	1	-
	ALLEGHENY RIVER	TARENTUM	8 5 68	21	90%	10%	-	3,000				4	20M	6	-
	BUFFALO CREEK	TAYLORSTOWN	9 29 68	13	45%	55%	-	450			3		1M	3	-
	TEN MILE CREEK	TEN MILE	7 19 68	28	80%	20%	-	1,488		2			3M	5	-
	BEAVER CREEK	THORNDALE	10 27 68	41	30%	70%	-	2,864			3		3M	1	-
	HATCH RUN	WARREN	7 8 68	11	5%	95%	-	1,000	1				1M	-	2
	E BR L ANTIETAM C	WAYNESBORO	10 1 68	28	10%	90%	-	2,397			3		2M	2	-
	WEST VALLEY CREEK	WHITFORD	4 14 68	23	100%	0%	-	102				4	1M	1	-
	BR JUNIATA RIVER	WILLIAMSBURG	7 24 68	23	90%	10%	-	1,200			3		2M	-	6
	POORHOUSE RUN	YORK	9 16 68	23	0%	100%	-	946	1				1M	-	6
	INDIAN CREEK	ZIONSVILLE	6 17 68	34	12%	88%	-	577			3		1M	-	4
RHODE ISLAND	WOONASQUATUCKET R	SMITHFIELD	6 19 68	28	50%	50%	-	5,000			3		250A	5	-
	CARRON POND	STILLWATER	3 8 68	28	20%	80%	-	300			3		-	14	-
SOUTH CAROLINA	HUFF CREEK	GREENVILLE	7 20 68	28	20%	80%	-	7,725	1				3M	1	-
	GREAT PEE DEE RIV	WALLACE	7 1 68	24	2%	98%	80%	56,884	1				31M	2	-

SOUTH DAKOTA	RATTLE CREEK	KEYSTONE	7	30	68	21	5%	95%	-	5,000	1			4M	-	-
	RAPID CREEK	RAPID CITY	6	22	68	31	-	-	-	-		2		10M	-	-
	BIG SIOUX RIVER	SIOUX CITY	7	7	68	11	0%	100%	-	100,000		2		6M	1	-
TENNESSEE	CHICKAMAUGA RESVR	UNNAMED	9	3	68	24	5%	95%	-	7,501		2		10M	5	-
	BEAVER CREEK	BRISTOL	10	10	68	22	0%	100%	-	675			4	1M	-	6
	NICKAJACK RESERVR	CHATTANOOGA	10	8	68	31	0%	100%	-	20,000		2		5M	1	-
	WOLFEVER CREEK	COLLEGEDALE	8	12	68	22	-	-	-	-			3	-	-	-
	BEAVER CREEK	KNOXVILLE	8	23	68	13	50%	50%	-	200			3	-	-	-
	TOWN CREEK	LEBANON	9	12	68	41	33%	67%	-	9,662		2		2M	5	-
	NOLICHUCKY RIVER	LOWLAND	7	1	68	24	10%	90%	-	-			3	4M	-	-
	LOOSAHATCHIE RIV	MEMPHIS	5	10	68	24	20%	80%	26%	5,000			-	7M	2	-
	CUMBERLAND RIVER	NASHVILLE	8	2	68	24	10%	90%	-	176,000		2		32M	4	-
	EWING CREEK	NASHVILLE	8	20	68	31	25%	75%	-	1,700		2		1M	2	-
	CUMBERLAND RIVER	NASHVILLE	10	17	68	31	5%	95%	-	7,000			3	9M	3	-
	CROCKETT CREEK	ROGERSVILLE	5	15	68	50	50%	50%	-	-			-	-	-	-
	MILL CREEK	SEVIER CO	6	25	68	34	70%	30%	-	230			3	1M	-	-
	BRADY POND	SEVIER CO	7	11	68	11	100%	0%	-	-		2		1A	1	-
	GISTS CREEK	SEVIERVILLE	8	18	68	13	50%	50%	-	300		2		2M	1	-
	TURNBULL CREEK	WHITE BLUFF	6	18	68	33	70%	30%	-	-			3	-	-	-
TEXAS	COLORADO RIVER	AUSTIN	11	18	68	31	5%	95%	-	500			4	1M	3	-
	LAKE PALMORHEA	PALMORHEA	7	16	68	11	94%	6%	-	685			4	573A	14	-
	SCOTTS BAY	BAYTOWN	9	10	68	31	5%	95%	-	1,000			3	1M	1	-
	OLMITO S FISH HAT	BROWNSVILLE	6	12	68	11	100%	0%	-	10,000	1			-	1	-
	GULF OF MEXICO	CARLEN	2	15	68	25	0%	100%	-	-			4	2M	1	-
	RED RIVER	CAREY	5	28	68	25	2%	98%	-	-		2		50M	5	-
	NUECES RIVER	CARRIZO SPRINGS	10	-	68	22	50%	50%	-	-			4	1M	1	-
	CORPUS CHRSTI BAY	CORPUS CHRISTI	12	28	68	50	0%	100%	-	100			4	-	-	-
	NUECES RIVER	CRYSTAL CITY	9	7	68	11	10%	90%	-	1,000			-	1M	2	-
	LAKE MADELINE	GALVESTON	9	6	68	31	100%	0%	-	1,500			4	-	1	-
	OFFATTS BAYOU	GALVESTON	8	22	68	31	0%	100%	-	250			4	-	3	-
	GEORGES CREEK	GLEN ROSE	8	5	68	28	-	-	-	-		2		1M	-	-
	PECOS RIVER	GRANDFALLS	5	28	68	28	0%	100%	-	-		2		2M	3	-
	EAGLETON CREEK	HARLETON	10	15	68	25	-	-	-	-		2		6M	-	-
	WICHITA RIVER	IOWA PARK	1	25	68	44	-	-	-	-		2		-	10	-
	PECOS RIVER	IRAAN-SHEFFIELD	11	-	68	50	50%	50%	-	-		2		70M	30	-
	BARRIGAS LAKE	KINGSVILLE	3	12	68	24	10%	90%	-	5,000			3	-	-	-
	CYPRIS CREEK	KOUNTZE	7	17	68	28	50%	50%	-	-		2		-	-	-
	HOUSTON SHIP CHNL	MORGANS POINT	9	18	68	31	10%	90%	50%	40,000		2		5M	2	-
	PAPALOTE CREEK	PAPALOTE	9	5	68	25	0%	100%	-	1,000			4	1M	1	-
	LAVACA BAY	PORT LAVACA	12	19	68	43	0%	100%	-	38			4	1A	-	-
	SAN ANTONIO RIVER	SAN ANTONIO	10	8	68	31	10%	90%	-	1,000			4	-	-	-
	FOSTER CREEK	SCHULENBURG	4	2	68	11	75%	25%	-	200			3	1M	2	-
	ROCKY CREEK	SHINER	3	9	68	31	100%	0%	-	1,000			3	5M	3	-
	MOSES LAKE	TEXAS CITY	6	20	68	24	2%	98%	95%	-			3	-	3	-
	INDUSTRIAL CANAL	TEXAS CITY	7	17	68	25	1%	99%	99%	300			4	1M	1	-
	NOODLE CR LK	TRENT	2	1	68	13	-	-	-	-	1			9M	30	-
	UNNAMED POND	TRINITY	6	25	68	23	100%	0%	-	3,000	1			-	3	-
	JOE FLEMING LAKE	TYLER	3	-	68	25	100%	0%	-	-			4	-	30	-
	GOLDEN ROD CREEK	YOAKUM	11	-	68	44	50%	50%	-	1,000			4	-	-	-
UTAH	PRICE RIVER	CASTLEGATE	3	1	68	35	15%	85%	-	150		2		-	1	-
	UTAH LAKE	OREM	9	1	68	21	90%	10%	10%	10,854		2		-	1	-
	UTAH LAKE	PROVO	1	11	68	26	75%	25%	-	60			4	-	-	-
	UTAH LAKE	PROVO	2	28	68	26	95%	5%	-	54			4	-	-	-
	SMITHFIELD CREEK	SMITHFIELD	7	17	68	50	75%	25%	-	300	1			7M	-	6
VIRGINIA	TOMS CREEK	BLACKSBURG	10	4	68	25	20%	80%	18%	1,410			-	3M	-	-
	FALLING CREEK	CHESTERFIELD CO	7	5	68	31	62%	38%	4%	1,200			4	1M	-	-
	JAMES RIVER	CHESTERFIELD CO	7	11	68	31	15%	85%	-	13,006			3	3M	-	-
	JAMES RIVER	CHESTERFIELD CO	7	27	68	31	80%	20%	20%	100,000		2		1M	-	-
	JAMES RIVER	CHESTERFIELD CO	8	13	68	31	6%	94%	-	16,000			3	3M	-	-
	GREGORYS POND	FALLING CREEK	11	25	68	21	76%	24%	-	2,922			-	80A	-	-
	MILL CREEK	GALAX	11	25	68	26	10%	90%	40%	-			-	-	-	-
	MAURY RIVER	GLASGOW	7	11	68	24	100%	0%	-	3,000			4	2M	-	-
	MAURY RIVER	GLASGOW	7	12	68	24	90%	10%	-	2,000			4	2M	-	-
	SOUTH ANNA RIVER	GORDONSVILLE	10	25	68	31	42%	58%	35%	47,230			-	26M	-	-
	MEHERRIN RIVER	GREENSVILLE CO	9	27	68	31	30%	70%	13%	33,440			-	3M	-	-
	BLACKWATER CREEK	LYNCHBURG	10	1	68	31	17%	83%	5%	60			-	1M	-	-
	APPOMATTOX RIVER	PETERSBURG	10	1	68	31	5%	95%	-	101,663			-	1M	-	-
	DITCH TO BACK BAY	PRINCESS ANN CO	5	24	68	11	84%	16%	-	1,200			3	1M	-	-
	JAMES R-PROCTR CR	RICHMOND	10	7	68	25	97%	3%	-	1,980			-	1M	-	-
	RACK CREEK	NR STARKEY	9	9	68	31	19%	81%	27%	10,250		2		4M	-	-
	E V WILLIAMS LAKE	VIRGINIA BEACH	7	28	68	31	-	-	100%	2,000			3	7A	-	-
WASHINGTON	PRIVATE POND	POULSBO	6	6	68	11	0%	100%	-	50		2		2A	-	-
	ROSING CREEK-LAKE	SEATTLE	10	25	68	25	100%	0%		2			4	1A 1M	-	1
	PILCHUCK RIVER	SNOHOMISH	1	7	68	33	95%	5%	33%	70,000		2		3M	-	6
WEST VIRGINIA	GLADE CREEK	BECKLEY	2	24	68	33	50%	50%	-	500			3	1M	7	-
	KANAWHA RIVER	BELLE	8	7	68	24	10%	90%	-	41,500		2		-	-	-
	WHITEDAY CREEK	FAIRMONT	9	12	68	50	5%	95%	-	300		2		2M	-	-
	DUNKARD CREEK	MORGANTOWN	8	6	68	21	35%	65%	-	5,000			-	-	-	-
	OHIO RIVER	NEW CUMBERLAND	12	16	68	35	1%	99%	-	9,500			4	1M	6	-
	SALT LICK	TERRA ALTA	9	25	68	25	5%	95%	-	4,000	1			2M	-	-
	OHIO RIVER	WHEELING	2	29	68	26	2%	98%	-	10,000			3	50M	3	-
WISCONSIN	YAHARA RIVER	DE FOREST	7	9	68	31	0%	100%	-	75		2		5M	2	-
	LITTLE WOLF RIVER	GALLOWAY	7	16	68	11	40%	60%	-	1,000	1			2M	-	-
	CEDAR CREEK	JACKSON	9	16	68	22	10%	90%	-	5,000		2		7M	-	-
	CAWLEY CREEK	LOYAL	6	30	68	22	10%	90%	-	-		2		3M	6	-
	LITTLE PLOVER	PLOVER	8	11	68	11	95%	5%	-	4,400		2		6M	-	-
	SIX MILE CREEK	WAUNAKEE	8	4	68	22	33%	67%	-	286			-	5M	5	-
WYOMING	ENCAMPMENT RIVER	RIVERSIDE	7	27	68	21	98%	2%	-	250		2		2M	1	-

REPORT OF FISH KILLS—CAUSE UNKNOWN

	RIVER OR LAKE	CITY OR TOWN	DATE	CAUSE UNKNOWN	TYPE % GAME	TYPE % NON-GAME	COMMERCIAL FISH LOSS(%)	ESTIMATED FISH KILLED	SEVERITY Complete (1)	SEVERITY Heavy (2)	SEVERITY Moderate (3)	SEVERITY Light (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION DAY	DURATION HOUR
CALIFORNIA	SANTA ANA RIVER	HUNTINGTON BCH	5 29 68	90	99%	1%	1%	5,000			3		2M	25	-
	E HIGHLINE CANAL	NILAND	6 25 68	90	40%	60%	5%	3,000				-	5M	3	-
CONNECTICUT	THAMES RIVER	NORWICH	5 2 68	90	1%	99%	-	6,500			3		-	-	-
FLORIDA	NO NEW RIVER CANL	TERRYTOWN	1 3 68	90	50%	50%	-	4,000				4	50M	5	-
GEORGIA	WITHLACOOCHEE RIV	ADEL	1 30 68	90	90%	10%	-	40				4	1M	-	-
HAWAII	AIEA STREAM	AIEA	8 10 68	90	0%	100%	-	1,000			3		1M	1	-
	KAPALAMA DRN CANL	HONOLULU	8 10 68	90	0%	100%	-	100,000			3		1M	1	-
	KUMUKAIU CANAL	HONOLULU	7 9 68	90	90%	10%	15%	5,000		2			2M	2	-
	ULEHAWA STREAM	WAIANAE	4 14 68	90	90%	10%	-	3,250		2			2M	1	-
ILLINOIS	S FK KISHWAUKEE R	SYCAMORE	3 20 68	90	4%	96%	96%	47,450			3		1M	1	-
IOWA	LITTLE SIOUX RIV	ANTHON	6 7 68	90	2%	98%	-	4,000			3		15M	1	15
	BIG SIOUX RIVER	SIOUX CITY	6 7 68	90	20%	80%	-	2,000		2			10M	1	-
KANSAS	SOLOMON RIVER	MINNEAPOLIS	6 8 68	90	50%	50%	50%	4,000			3		50M	3	-
	WHITE ROCK CREEK	REPUBLIC	7 28 68	90	1%	99%	2%	600				4	1M	1	-
	LIT ARKANSAS RIV	HENDRICK	7 15 68	90	5%	95%	15%	4,000		2			1M	3	-
	WHITEWATER RIVER	TOWANDA	10 16 68	90	30%	70%	40%	10,000			3		1M	2	-
KENTUCKY	CLOVER FK-CUMBRLD	HARLAN	2 20 68	90	40%	60%	-	-		2			4M	1	-
	ELK FORK CREEK	WEST LIBERTY	8 1 68	90	-	-	-	-				-	15M	1	-
LOUISIANA	COMITE RIVER	DEERFORD	9 2 68	90	50%	50%	25%	-		2			10M	1	-
	VERMILLION RIVER	LAFAYETTE	9 10 68	90	0%	100%	50%	-				4	30M	1	-
	BAYOU BREAUX	SAINT GABRIEL	11 14 68	90	40%	70%	10%	-		2			2M	1	-
MASSACHUSETTS	WESTFIELD R-MAIN	WESTFIELD	8 7 68	90	1%	99%	-	10,000		2			3M	2	-
MISSOURI	OTTER CREEK	GRANVILLE	8 21 68	90	24%	76%	-	4,285		2			1M	1	-
	BUFFALO CREEK	LOUISIANA	8 22 68	90	-	-	-	500				4	1M	1	-
MONTANA	WARM SPRINGS CR	ANACONDA	7 15 68	90	100%	0%	-	700		2			3M	1	-
NEBRASKA	SO FK NEMAHA RIV	DAWSON	6 2 68	90	5%	95%	-	1,000				4	1M	-	-
	WOOD RIVER	GRAND ISLAND	9 29 68	90	0%	100%	-	-			3		-	-	-
	WEST FK BLUE RIV	MCCOOL JUNCTION	5 23 68	90	5%	95%	-	1,500		2			3M	1	6
NEW HAMPSHIRE	SUNAPEE LAKE	NEW LONDON	5 1 68	90	100%	0%	-	5,000			3		40,000A	2	-
NEW JERSEY	CREAM RIDGE POND	ALLENTOWN	8 15 68	90	15%	85%	-	200		2			2A	1	-
	WHITNEY LAKE	CRANBURY	7 16 68	90	0%	100%	-	500			3		-	-	-
	GOLD RUN	EWINGVILLE	11 7 68	90	0%	100%	-	2,000	1				5A	1	-
	MILLSTONE RIVER	MANVILLE	7 22 68	90	10%	90%	-	2,500		2			10M	2	-
	SUNNY JIM POND	MEDFORD	7 27 68	90	5%	95%	-	-		2			2A	1	-
	STRAWBRIDGE LAKE	MORRISTOWN	8 10 68	90	0%	100%	-	500		2			22A	1	-
	COLLARDS POND	PISCATAWAY	7 26 68	90	0%	100%	-	50			3		1A	1	-
	RAHWAY RIVER	RAHWAY	8 31 68	90	0%	100%	-	50			3		1M	1	-
	WOODBURY LAKE	WOODBURY	7 16 68	90	0%	100%	-	10				4	-	1	-
NEW YORK	SIX MILE CREEK	ITHACA	6 24 68	90	2%	98%	-	1,000		2			1M	1	-
	CHADAKOIN RIVER	CANEADEAN	5 13 68	90	0%	100%	-	500				-	1M	1	-
	CHENANGO RIVER	GREENE	7 15 68	90	10%	90%	-	5,000		2		-	6M	1	-
	CASPER CREEK	ROUSEVILLE	4 - 68	90	0%	100%	-	-				-	4M	1	-
	WAYAYANDA CREEK	WARWICK	4 18 68	90	10%	90%	-	400		2			1M	1	-
NORTH CAROLINA	SANDY CREEK	KENANSVI	10 5 68	90	10%	90%	15%	200				4	1M	-	-
OHIO	ASHTABULA RIVER	ASHTABULA CO	6 12 68	90	-	-	-	2,110				-	-	-	-
	GR MIAMI RIVER	BUTLER CO	8 25 68	90	-	-	-	445				-	-	-	-
	STILL FORK CREEK	CARROLL CO	7 16 68	90	-	-	-	238				-	-	-	-
	N FK MID BEAVER	COLUMBIANA CO	5 24 68	90	-	-	-	6				-	-	-	-
	MID FK BEAVER CR	COLUMBIANA CO	6 17 68	90	-	-	-	320				-	-	-	-
	MID FK LIT BEAVER	COLUMBIANA CO	9 10 68	90	-	-	-	12				-	-	-	-
	COLD CREEK	COLUMBIANA CO	11 8 68	90	-	-	-	19				-	-	-	-
	BULL CREEK	COLUMBIANA CO	12 10 68	90	-	-	-	7				-	-	-	-
	SANDUSKY RIVER	CRAWFORD CO	7 15 68	90	-	-	-	2,160				-	-	-	-
	ALUM CREEK	FRANKLIN CO	7 8 68	90	-	-	-	15				-	-	-	-
	SCIOTO RIVER	FRANKLIN CO	9 6 68	90	-	-	-	227				-	-	-	-
	ALUM CREEK	FRANKLIN CO	9 7 68	90	-	-	-	115				-	-	-	-
	ALUM CREEK	FRANKLIN CO	11 6 68	90	-	-	-	14				-	-	-	-

	SHAWNEE CREEK	GREENE CO	8 20 68	90	-	-	-	50			-	-	-	-	-	-	-	
	PINCHIN CREEK	HIGHLAND CO	8 19 68	90	-	-	-	70			-	-	-	-	-	-	-	
	GRAND RIVER	LAKE CO	8 9 68	90	-	-	-	270			-	-	-	-	-	-	-	
	LITTLE SALT CREEK	MUSKINGUM CO	9 7 68	90	-	-	-	40			-	-	-	-	-	-	-	
	SEVEN MILE CREEK	PREBLE CO	8 31 68	90	-	-	-	504			-	-	-	-	-	-	-	
	SCIOTO RIVER	ROSS CO	11 5 68	90	-	-	-	270			-	-	-	-	-	-	-	
	NIMISHILLEN CREEK	STARK CO	5 3 69	90	-	-	-	10			-	-	-	-	-	-	-	
	NELLYS CREEK	STARK CO	8 13 68	90	-	-	-	30			-	-	-	-	-	-	-	
	NESMITH LAKE	SUMMIT CO	6 24 68	90	-	-	-	1			-	-	-	-	-	-	-	
	BULL RUN CR	WARREN CO	11 19 68	90	-	-	-	15			-	-	-	-	-	-	-	
PENNSYLVANIA	JORDAN CREEK	ALLENTOWN	7 7 68	90	-	-	-	85										
	BRADYS RUN LAKE	BEAVER FALLS	5 4 68	90	100%	0%	-	338			3		4	1M	-	-	-	
	MUSKRAT RUN	CASHTOWN	4 9 68	90	100%	0%	-	40			3			-	-	-	-	
	FRENCH CREEK	COCHRANTON	9 11 68	90	100%	0%	-	2,000		2				2M	1	-		
	BLACKBURN CREEK	GLENROY	7 13 68	90	100%	0%	-	80					4	1M	1	-		
	SAUCON CREEK	HELLERTOWN	5 16 68	90	100%	0%	-	-					4	2M	1	-		
	LITITZ SPRING CR	LITITZ	7 18 68	90	1.0%	0%	-	16			5		4	1M	1	4		
	DELAWARE RIVER	MARTINS CREEK	1 27 68	90	100%	0%	-	16						1M	1	10		
	FRENCH CREEK	MEADVILLE	8 24 68	90	30%	70%	-	85,000		2			4	1M	1	-		
	RIV LEHIGH RIVER	TREICHLERS	9 15 68	90	100%	0%	-	100					4	1M	1	9		
TENNESSEE	FALLING WATER RIV	COKEVILLE	11 29 68	90	0%	100%	-	170					4	-	4	-		
	B AVERETTE POND	DICKSON	5 13 68	90	100%	0%	-	2,725		2				6A	2	-		
	CREEKMOORE POND	HARRIMAN	8 22 68	90	100%	0%	-	-		2				1A	1	-		
	BOONE RESERVOIR	JOHNSON CITY	7 9 68	90	5%	95%	-	557,000			3			-	-	-		
	BOONE RESERVOIR	JOHNSON CITY	9 23 68	90	0%	15%	-	275					4	-	2	-		
	PATRK HENRY RESVR	KINGSPORT	8 11 68	90	0	100%	-	10,000					4	3M	1	2		
	PERCY PRIEST LAKE	LA VERGNE	6 25 68	90	-	-	-	198,000		2				200A	1	-		
	NORTH RIVER	MADISONVILLE	7 30 68	90	10%	0%	-	500			3			-	1	-		
	HOLSTON RIVER	ROGERSVILLE	5 4 68	90	0%	100%	-	400					4	-	1	-		
	LITTLE PIGEON RIV	SEVIERVILLE	7 13 68	90	70%	20%	-	20						1A	*	-		
	LITTLE PIGEON RIV	SEVIERVILLE	8 27 68	90	0%	99%	-	100			5		4	1A	*	-		
TEXAS	SAN FERNANDO CR	BISHOP	9 24 68	90	0%	100%	-	1,000					4	6M	1	-		
	COLORADO RIVER	GOLDTHWAITE	8 10 68	90	-	-	-	-	1					6A	-	-		
	STRIKER LAKE	HENDERSON	4 8 68	90	100%	0%	-	-					4	-	6	-		
	WILLOW LAKE	HENDERSON	6 16 68	90	10%	90%	-	10		2				-	1	-		
	BUFFALO BAYOU	KATY	8 2 68	90	0%	75%	5%	100		2			4	2M	1	-		
	MATAGORDA BAY	MATAGORDA	6 29 68	90	50%	45%	5%	1,000		2			4	10A	2	-		
	CHOCOLATE BAYOU	PORT LAVACA	7 22 68	90	0%	100%	-	100					4	3A	*	-		
	SABINE RIVER	TATUM	9 2 68	90	0%	100%	-	1,000		2			4	10A	2	-		
	PARADISE CREEK	VERNON	6 26 68	90	0%	100%	-	750		2				3M	1	-		
WASHINGTON	UNNAMED CREEK	DES MOINES	5 10 68	90	90%	10%	-	100	1					1A	1	-		
	DES MOINES CREEK	DES MOINES	5 24 68	90	90%	10%	-	250	1					4A	1	-		
	HURLEY CREEK	GIG HARBOR	11 27 68	90	-	-	-	-						-	-	-		
	ISSAQUAH CREEK	ISSAQUAH	3 18 68	90	100%	0%	-	50					4	2A	*	-		
	SWAMP CREEK	LYNNWOOD	6 18 68	90	90%	10%	100#	400		2				1M	*	-		
WEST VIRGINIA	SANDY CREEK	PARKERSBURG	8 29 68	90	20%	80%	-	-		2				6A	*	-		
WISCONSIN	FOX RIV-POPLAR CR	WAUKESHA-NEWFLD	6 11 68	90	10%	90%	-	1,000	1					7	*	-		

Join the fight for CLEAN WATER

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WALTER J. HICKEL
Secretary of the Interior

CARL L. KLEIN
Assistant Secretary for Water Quality and Research

DAVID D. DOMINICK
Commissioner, Federal Water Pollution Control Administration

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

U. S. DEPARTMENT OF THE INTERIOR

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources." The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.